Southern Power & Industry

The Industrial and Power Journal of the South and Southwest

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AUGUST, 1957

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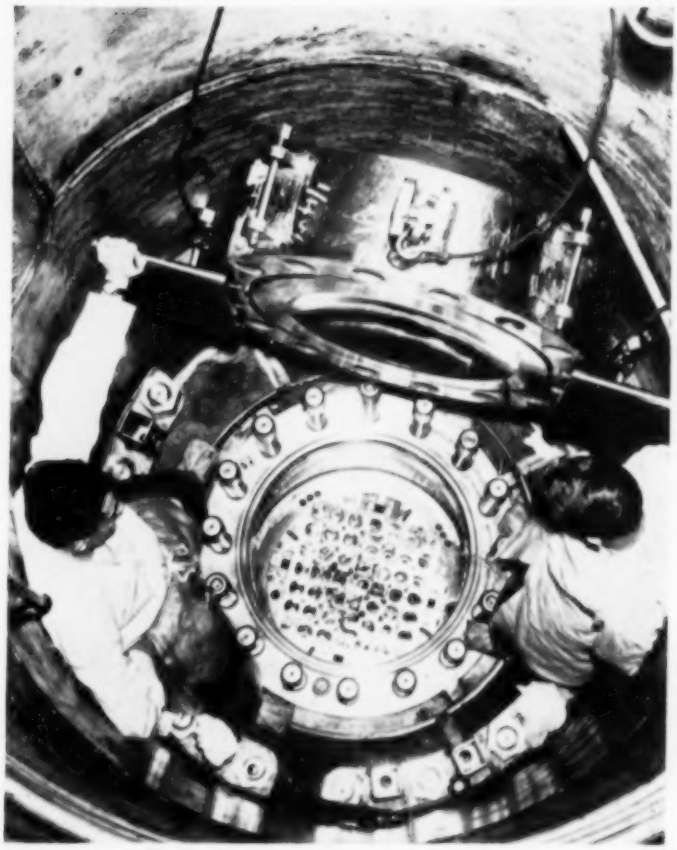

NUCLEAR POWER IN VIRGINIA — another "first" for the South. **John F. Lee,** SPI's Consultant on Atomics, reports on design and operating features of the 2,035 kw plant. See page 36.

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One of many reasons why **ALLIS-CHALMERS MOTORS**
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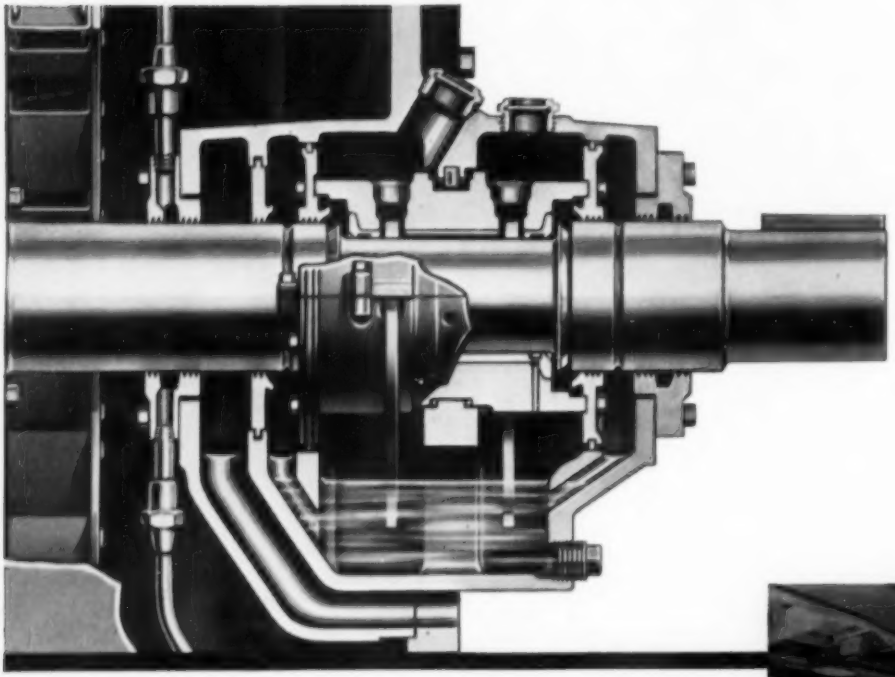

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Volume 75 Number 8

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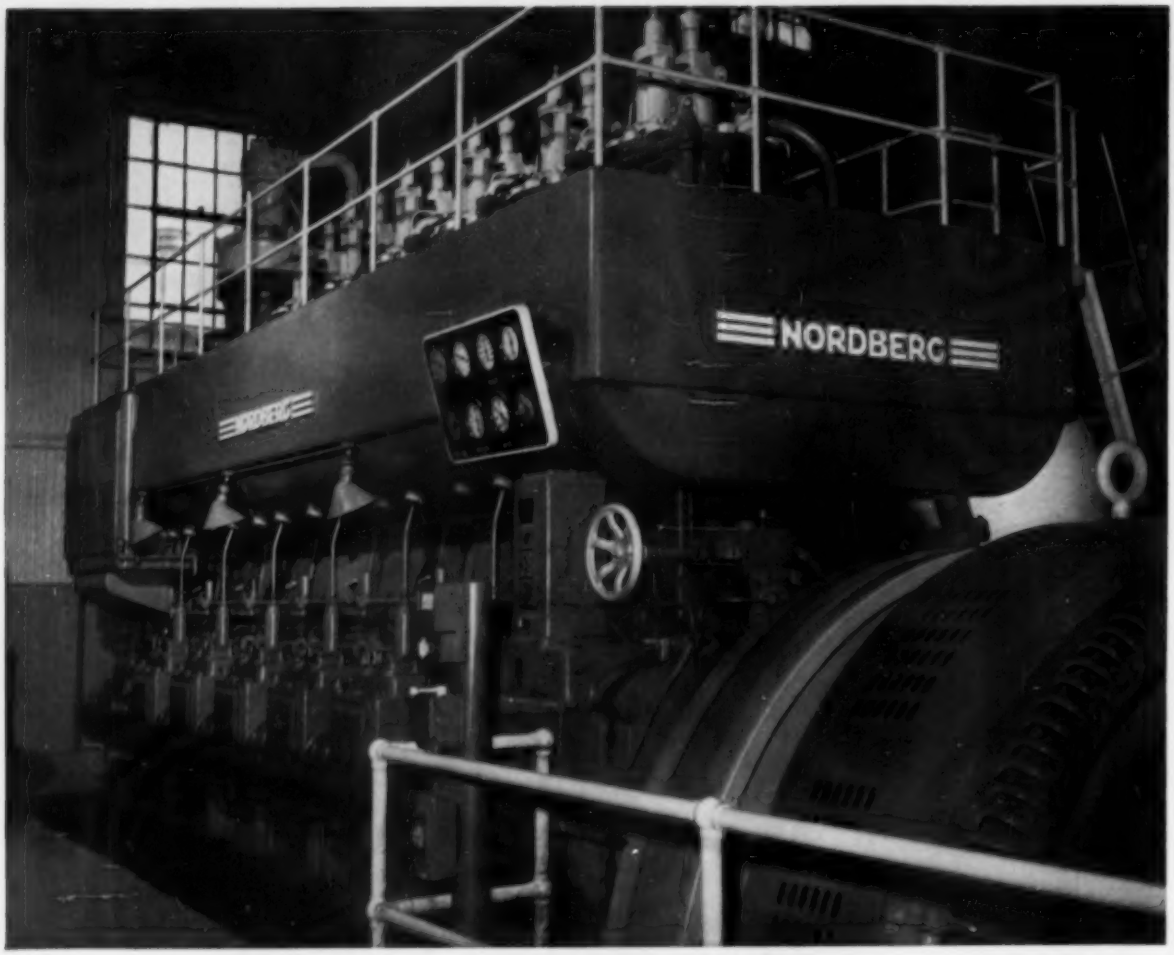

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Editorial and Executive Offices: **SOUTHERN POWER & INDUSTRY, 806 PEACHTREE ST., N. E. ATLANTA 8, GA.**

Facts and Trends

August 1, 1957

◆ GAS TURBINE PERFORMANCE—a four year operating report by West Texas Utilities is featured in SPI for July and August. Report by A. R. Cox of the production department (SPI for July, page 36) featured tabulations of serviceability, unserviceable hours, fuel economy and capability and a laboratory report of compressor deposit.

Detailed maintenance procedures are outlined in this issue. West Texas Utilities is now installing its third gas turbine unit. It will be a duplicate of the Company's first unit which was placed in service in December, 1952.

◆ CENTRIFUGAL COMPRESSOR delivering 83,000 cfm of air at 47.4 psia to one of the largest U.O.P. cat crackers ever built, is now operating at the Ashland Oil & Refining Company plant at Ashland, Kentucky. Cat cracking unit is processing 20,000 barrels per day.

The De Laval compressor is driven by one of the largest extraction steam turbines in refinery service. Extracting 150,000 lbs of steam per hour at 155 psig., the turbine is designed for 440 psi, operating at 700 F with 1 1/2" hg vacuum.

◆ NUCLEAR POWER came to the South in April when the 2035 kw Army Package Power Reactor was dedicated at Fort Belvoir, Virginia. It is among the nation's first nuclear power plants to go into operation.

It is unusual because it is the first completely integrated generating plant using the pressurized water concept. It is also the first of a series being developed by the U. S. Army and the Atomic Energy Commission, John F. Lee of North Carolina State College and SPI's Consultant on Atomics, describes the plant and operation in this issue.

◆ "BUS BAR" PROTECTION RELAY was exhibited at a recent Houston AIEE meeting by Electrical Service Company of Greenville, Texas. Unit protects a transformer and its connected load against outage or damage from voltage unbalance, single-phasing, or motor overload.

At the Houston exhibit the spectator was invited to name the fault, the degree he wanted to see imposed, and under what load conditions. He was then invited to take over the control of a Demonstration Panel and "mix his own brew" of faults. The Esco protecting relay always dropped the motor out without damage. For details see "New Product Briefs" in this issue.

◆ PVC LIFT CHECK VALVES—A 1-in. valve, in operation at Tennessee Gas Transmission Company's Greensburg, Kentucky plant since early

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Facts and Trends (Continued)

January, 1957, has opened and closed 37,905 times per day, on the average, with no sign of wear. The line carries a 10-15% sulfuric acid solution, which bears traces of sand in suspension and serves a 72-stroke per minute pump. There is a 6 ft discharge head and an 8 in. to 20 in. suction lift. Operating temperatures are within the range of 50-75 F.

Above valve was a prototype of a new all-polyvinyl chloride lift check valve line (1/2 to 3 in. sizes) being produced by Tube Turns Plastics, Inc. They operate in either a vertical or horizontal position, and open and close under less than 6 lb pressure. Only moving part is a self-energizing disk.

◆ CHEMICAL TEXTILE FIBERS is almost wholly a southern industry and its rapid expansion indicates that it will become one of the most important manufacturing operations in the South. Current use of synthetic fibers (not including cellulosic fibers such as rayon) is just under half a billion pounds a year. Annual consumption by 1965 has been estimated at 1.1 billion pounds. Types being produced and current and future applications were summarized in SPI for April, page 39.

One of the largest producers is the 7,000 employee Chemstrand Corporation with a huge Acrilan plant, research center and corporate headquarters at Decatur, Alabama and a 50 million pound nylon manufacturing plant at Pensacola, Florida.

Chemstrand is now expanding both of these plants—the Acrilan plant from 30 to 45 million pounds annual rated capacity and the nylon plant to 114 million pounds. Both expansions are scheduled for completion during 1958.

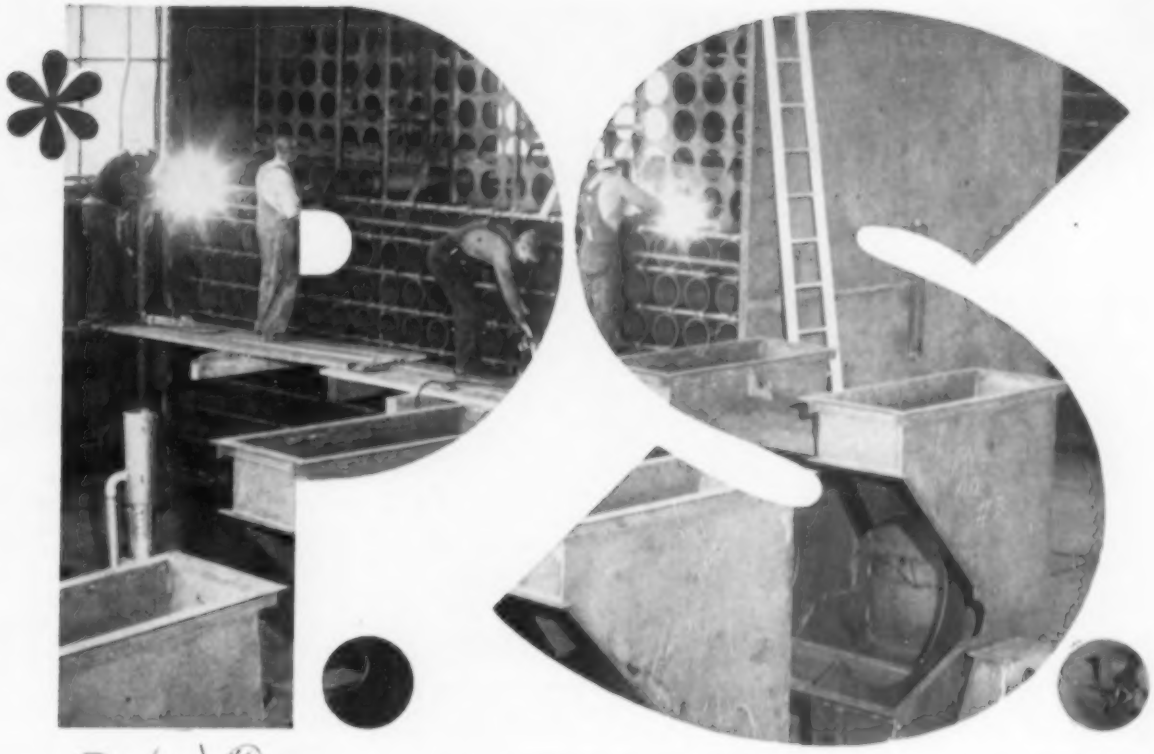
◆ RECORD "HIGHS" AT TVA—A second Westinghouse 250,000 kw inner-cooled generator has been placed in service at TVA's Gallatin Station as Unit No. 2. The first 250,000 kw unit has been in operation since October, 1956.

Generator installations represent record highs in this country. The 250,000 kw, 277,778 kva rating is based on 0.9 pf, 0.7 scr and operates at 30 psig hydrogen pressure. The high-voltage stator coils are insulated with Thermalastic insulation.

High power of the unit is made possible by inner cooling. Windings are constructed with vents extending full length of the coil. Cooling medium is introduced within the high voltage insulation in close contact with the conductors. This construction eliminates the temperature rise in the steel and in the high-voltage insulation.

◆ 'FIRST FULLY INTEGRATED TURBINE' for boiler feed pump drive has been put into operation for the No. 6 unit at the Glen Lyn, Virginia, station of Appalachian Electric Power Co. The General Electric turbine is rated 6230 hp at 5610 rpm. Maximum inlet pressure, upper half admission—600 lb; maximum inlet pressure, lower half admission—2400 lb.

Reasons reported for reverting to the turbines for feed pump drives, after motors dominated the field for years, include: (1) The size of unit justifies integrating exhaust with the feedwater heating cycle, and (2) The two-pressure feature of this turbine brings new economies.



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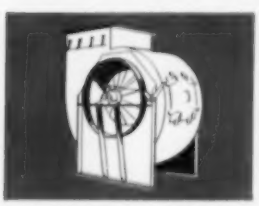

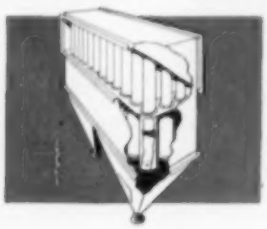

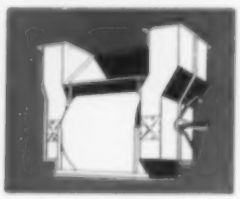

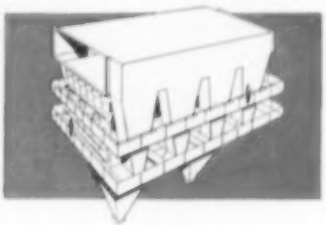

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NEWS for the South & Southwest

Leslie — Southeast

Leslie Co. of Lyndhurst, N. J. announces the appointment of **Roy D. Kelley** of Atlanta, Ga., as District Sales Manager for the Southeastern United States.

Mr. Kelley, who joined Leslie Co. in 1956, started his career as a control engineer with the Ohio Edison Power Company in 1938. In 1945, he joined the Bailey Meter Company as a sales engineer at their Buffalo, N. Y. branch. Transferred in 1952 to the firm's foreign division, his overseas assignment took him to Naples, Italy and Palermo, Sicily where he was resident manager for new power plant construction in these two cities.

Mexico Refractories — Texas

Lloyd L. Brightman has been appointed vice president and general manager of **Mexico Refractories Co.** of Texas, successors to Royall Fire Brick and Supply Co., with offices and warehouses in Houston and Dallas. Brightman has had 20 years' experience in sales and executive capacities in the field of refractories in the Gulf Coast area.

Morris S. Lindsey has been appointed sales manager of the company, covering the major portion of Texas with the exception of the Panhandle. Lindsey also has had more than 20 years' experience in the Gulf Coast area in refractories sales and application.

More Synthetic Rubber From Texas

PROCESS UNITS of Odessa Butadiene Company's new 50,000 tons-per-year butadiene plant at Odessa, Texas, went on stream in July. $20 million installation was designed, engineered and constructed by The Fluor Corporation, Ltd.

Photo shows absorption and fractionation section at the left and hydrogenation section at the right. Towers (1-r) are the stripper column, depropanizer, and the deoiler. Quench and pre-quench towers are at far right. The Odessa plant is the first integrated operation since World War II in which synthetic rubber is produced from butane at one location.

Olin Aluminum Opens Southeastern Offices

The Aluminum Division of **Olin Mathieson Chemical Corporation** has opened sales offices in **Atlanta,** Georgia and **Miami,** Florida.

The Atlanta District Office at 1330 West Peachtree St., N.W., will be managed by **John C. Spencer;** a branch office of the district at 8340 N.E. Second Ave., Miami, will be managed by **Keith C. Carothers.**

Olin Mathieson's aluminum operations begin in South America, extend to Louisiana, then to the Ohio River Valley, and from there span the nation.

Bauxite, mined in Dutch Guiana, is carried by ship to a plant now being built on the banks of the Mississippi at **Burnside, Louisiana,** 35 miles south of Baton Rouge. This plant, which will receive approximately 700,000 tons of bauxite a year, will be operated by **Ormet Corporation.** Ownership of Ormet is shared jointly by Olin Mathieson and Revere Copper and Brass.

At Burnside, the bauxite is made into alumina. By barge, 350,000 tons of alumina a year will be transported to the Ormet reduction plant under construction near Clarington, Ohio. There the alumina will be reduced into primary aluminum at the rate of 180,000 tons a year. At the end of the ingot line in the reduction plant, the joint effort between Olin Mathieson and Revere ends and the two companies become competitors in the production and sale of finished aluminum.

Of the 180,000 tons produced by Ormet, Olin Mathieson will receive 120,000 tons and Revere 60,000. Half of the primary metal for Olin Mathieson -- or 60,000 tons a year — will go to the huge fabrication plant being built by Olin Mathieson adjacent to the reduction plant on the Ohio River Valley site. There, in a series of cold mills and hot mills, it will be transformed into finished sheets and coils.

(*Continued on page* 12)

This Bailey Control System helps cut fuel costs on a 70,000 lb per hr capacity 125 psi boiler in an industrial plant. Control drive in foreground regulates stoker.

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Bailey Engineers have been making steam plants work more efficiently for more than forty years. Veteran engineer and young engineer alike, the men who represent Bailey, are storehouses of knowledge on measurement and control. They are up-to-the-minute on the latest developments that can be applied to your problem.

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Cross section of Yarway Impulse Steam Trap showing the only moving part, a small stainless steel valve. It actually floats on the condensate load.

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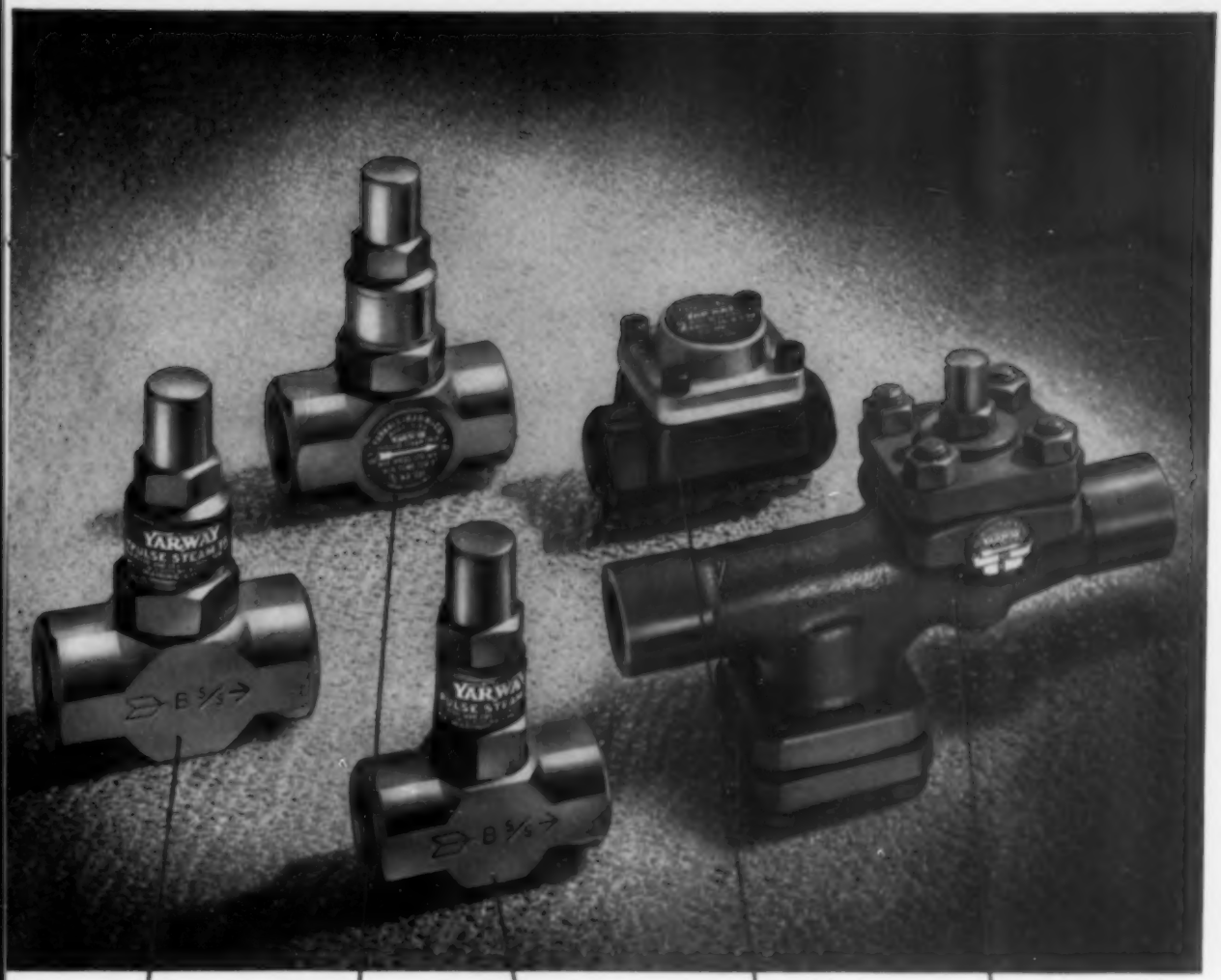

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News for the South & Southwest (Continued)

Garrett Oil Tools — New Longview Plant

Located just east of Longview, Texas, **Garrett Oil Tools'** new 86,000 sq ft fabricating plant planned for possible expansion to 490,000 sq ft. The company, a division of U. S. Industries, Inc., is a leading producer of gas lift valves. Other products include automatic tank switching, automatic safety controls and a complete line of medium and high pressure relief valves for the oil and gas transmission and distribution industries.

ASME Officers

James N. Landis, vice-president of Bechtel Corporation, one of the nation's leading engineering firms, has been nominated as president of The American Society of Mechanical Engineers. He will be installed in office during the ASME annual meeting in New York City in December.

Regional vice presidents and directors nominated include: **Charles Crede,** Vice President, Barry Controls, Inc., Watertown, Mass.; **Arthur W. Weber,** Vice President, Corning Glass Works, Corning, N. Y.; and **Ernst Allardt,** Chief Engineer, The Babcock & Wilcox Co., Tubular Products Div., Alliance, Ohio.

Oscar B. Schier, II, has been designated Secretary-Elect of the ASME succeeding **Clarence E. Davies,** who will retire as Secretary after 23 years of service in this office.

Harrington — Ala.

Gulf Coast Marine Supply Company, Royal and Monroe Streets, Mobile, Alabama, has been appointed exclusive distributor in southwest Alabama by **The Harrington Company,** Plymouth Meeting, Pa.

The Harrington Company manufactures a complete line of chain hoists, electric hoists, lever pullers, trolleys and cranes.

G.E. — Southeastern District

R. H. Jackson, Southeastern District Manager of General Electric Company's newly organized User Industry Sales Department has announced appointment of 6 new Managers.

G. E. Hoopingarner, Industrial Sales Engineer in Mobile, Alabama since 1952, was named District Product Sales Manager. His new headquarters will be in Atlanta. An Electrical Engineering graduate of Tri-State College, Angola, Indiana, he joined the General Electric Company in 1942.

Appointed as Manager of Utility Sales for Alabama and Georgia was **John C. Ager,** who has been Georgia Manager of User Industry Sales. Ager, a 1940 graduate of Duke University with a degree in Electrical Engineering, joined General Electric in 1946. He has been in Atlanta for 10 years, serving as Sales Engineer, Atlanta Office Manager and Georgia User Sales Manager.

James L. Townsend, District Manager of Advertising and Sales Promotion, was appointed Manager of Industry Sales for Georgia and Florida. He has been with General Electric for 32 years — dating from his graduation in 1925 from Syracuse University, New York. He has served previously in Sales Management positions in General Electric's Motor Division, Commercial Refrigeration Division, and Apparatus Sales Division.

H. B. Greear, Senior District Application Engineer, was appointed District Manager of Application Engineering with headquarters in Atlanta. A veteran of 35 years with General Electric, Mr. Greear is a native Virginian and a graduate of Virginia Polytechnic Institute.

J. W. Stone, District Lighting Specialist, has been named District Manager of Marketing Research. Stone is a 1948 graduate of the University of Alabama, and served in various General Electric locations before coming to Atlanta in 1956.

R. L. Buchanan, Sales Promotion Specialist, is the new Southeastern District Manager of Sales Promotion, with headquarters in Atlanta. A native of Geneseo, New York, he is an Electrial Engineering graduate of Union College, Schenectady. He transferred from Engineering to General Electric's Advertising course in 1949 and came to Atlanta 3 years ago.

Md. Shipbuilding & Drydock — MacNeil Valve

Announcement has been made that the Industrial Products Division (MARIND) of **Maryland Shipbuilding & Drydock Company** has entered into an agreement with George L. MacNeill under which they will be licensed to manufacture the condenser reversing valve on which he holds the patents.

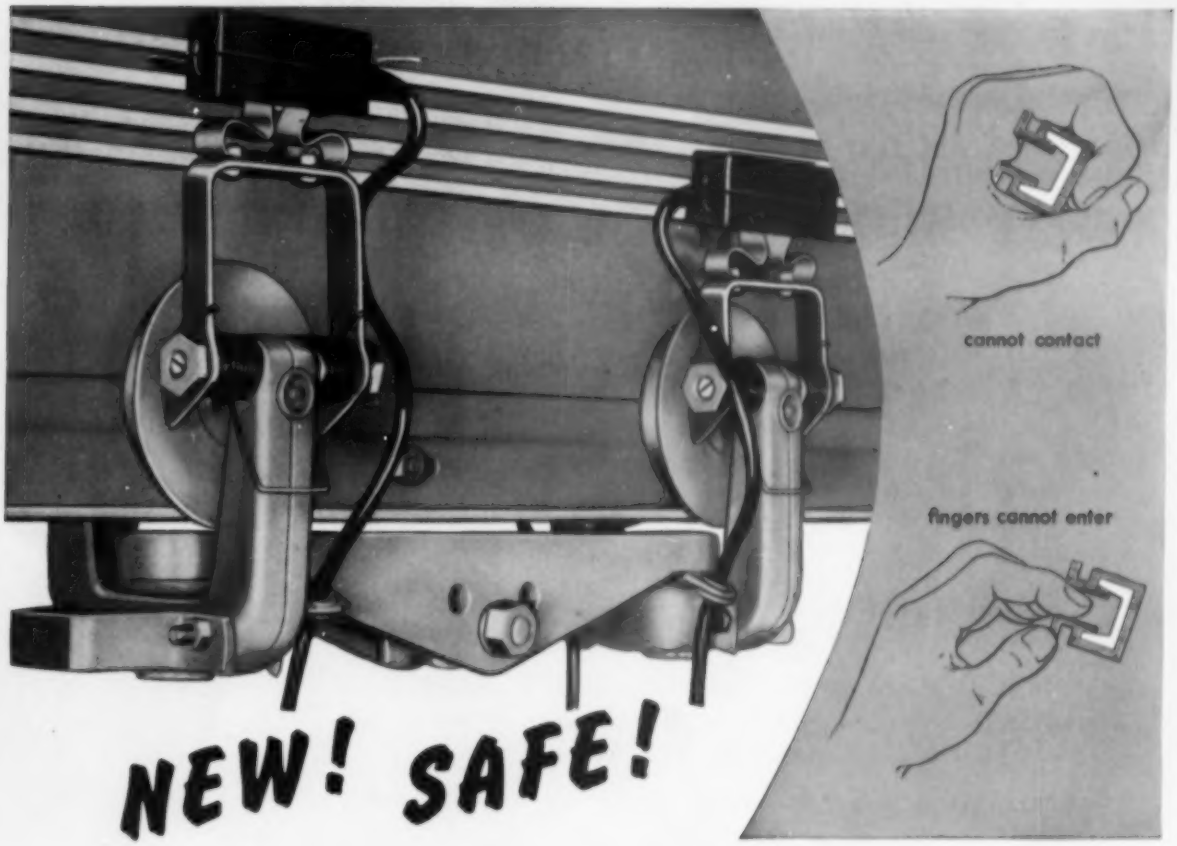
The MacNeill valve is a self-contained, motor-operated unit utilized by the utility field for reversing the flow of circulating water through surface condensers. This valve eliminates the complex piping and valves necessary to back-wash the condenser while in operation.

A. M. Byers — South

Frank W. Stokes has been assigned as a field service engineer to **A. M. Byers Company's** Atlanta, Ga., Division office, it was announced by H. R. Rowland, general manager of sales.

In his new assignment, Mr. Stokes will cover the Florida area, reporting to Division Manager **J. A. Cain** in Atlanta. He was formerly employed by the T. T. Jones Construction Company, Atlanta, Ga.

(*Continued on page* 26)



AMERICAN MONORAIL

KANT SHOCK

SHIELDED ELECTRIFICATION

For Monorail Track and Crane Systems

By covering its standard bus bar electrification with a specially designed polyvinyl chloride extrusion, American MonoRail now furnishes completely safe electrified systems.

This KANT-SHOCK shielding absolutely prevents accidental contact with live bus bars. It is impossible for an adult's finger to enter the shield.

A new type sliding shoe collector provides a floating contact throughout a monorail system regardless of any misalignment due to bent bars or at switch and inter-lock connections.

KANT-SHOCK Electrification positively eliminates all the hazards of open bar conductors—prevents costly accidents—protects employees—reduces insurance rates.

Write for KANT-SHOCK Bulletin KS-1

Member of Materials Handling Institute and Monorail Manufacturers Association

For Power Driven Conveyors, Use Landahl Chainless Conveyors

AMERICAN MONORAIL COMPANY

OVERHEAD HANDLING EQUIPMENT

13105 ATHENS AVENUE, CLEVELAND 7, OHIO (IN CANADA—CANADIAN MONORAIL CO., LTD., GALT, ONT.)

"Our Turbo Air Blowers were often shutdown by motor starting currents . . . *until we changed to Fusetron Fuses*"

"As our Turbo air blowers build up speed there is a back up pressure exerted which puts an overload on the motors. Consequently, it takes longer for the motors to gain normal running speed.

"Frequently, the 100 ampere renewable fuses we were using couldn't hold these overloads—and we would have a shutdown.

"We were anxious to eliminate these down-periods, but we didn't want to sacrifice safe fuse protection on our 30 h. p., 3600 R. P. M., 220 volt, 3 phase, 60 cycle motors that power the Turbo air blowers.

"We decided to protect these motors with 100 ampere Fusetron dual-element fuses. This move proved to be the answer to our problem. Since changing to Fusetron fuses we haven't had any trouble with our Turbo air blowers being 'knocked out' on motor starting currents."

B. D. McGaughey
ELECTRICAL SUPERINTENDENT,
Copperweld Steel Company, Glassport, Pa.

HERE'S HOW FUSETRON FUSES PROTECT AGAINST NEEDLESS BLOWS CAUSED BY HARMLESS OVERLOADS.

Fusetron dual-element fuses will hold motor-starting currents or other harmless overloads without opening because they have a tremendous time-lag.

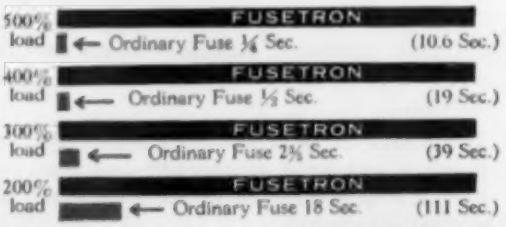
A machine may momentarily stall or be overloaded and Fusetron fuses won't open.

A motor may be started under heavy load—or all the motors on a circuit may be started at once—and Fusetron fuses won't open.

Circuits can be loaded nearer to the capacity of panelboards and switches without having Fusetron fuses open needlessly.

Here's a comparison of time-lag between Fusetron and ordinary fuses

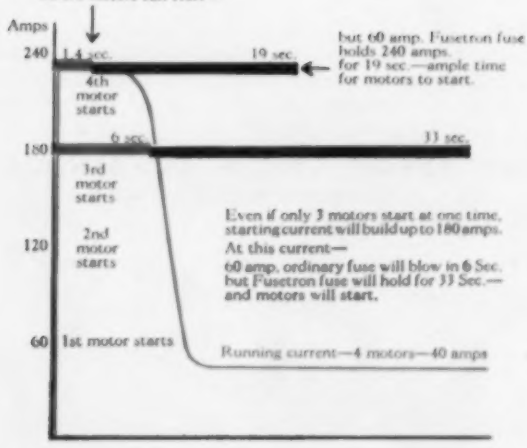
Notice that even at 500% load a Fusetron fuse will hold on for more than 10 seconds—while an ordinary fuse will open in less than ¼ second. Yet, with all this time-lag, there is no sacrifice of safety.



Comparison is based on ordinary fuses with the longest time-lag. Figures apply to 30 amp. 250 volt size. Opening time on larger sizes and on 600 volt sizes is longer.

Here's an example of how Fusetron fuse time-lag works

For example: take four 10 amp. motors on a circuit. 60 amp. ordinary fuses would be used to protect the circuit. BUT see what happens when four motors start at one time. The starting current of each motor is about 60 amps. so the combined starting currents would reach 240 amps.



So with Fusetron fuses installed in Mains, Feeders and all Branch circuits—shutdowns caused by needless blowing of fuses are ENTIRELY WIPED OUT.

Don't risk losses! One needless shutdown . . . one lost motor . . . one destroyed switch or panel . . . one burned out solenoid . . . may cost you far more than replacing every ordinary fuse with Fusetron dual-element fuses. Write for bulletin FIS.

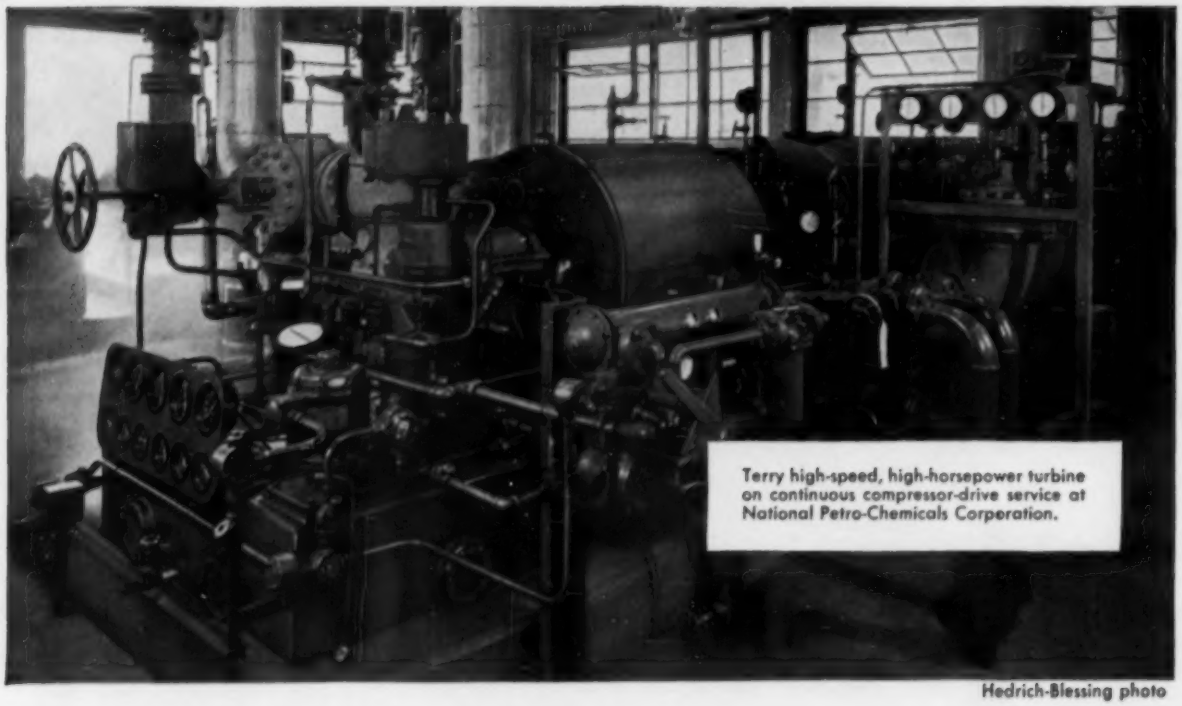
For loads above 600 amps.— Use BUSS Hi-Cap Fuses to coordinate your electrical circuits.

On 600 volts or less, BUSS Hi-Cap fuses have an interrupting capacity sufficient to handle any fault current regardless of system growth.

They can be coordinated with Fusetron fuses on feeder and branch circuits to limit fault outages to circuits of origin. Write for bulletin HCS.

Bussmann Mfg. Division *(McGraw-Edison Co.)*
University at Jefferson, St. Louis 7, Mo.

Play safe! *install Fusetron dual-element fuses and BUSS Hi-Cap Fuses throughout entire Electrical System!*

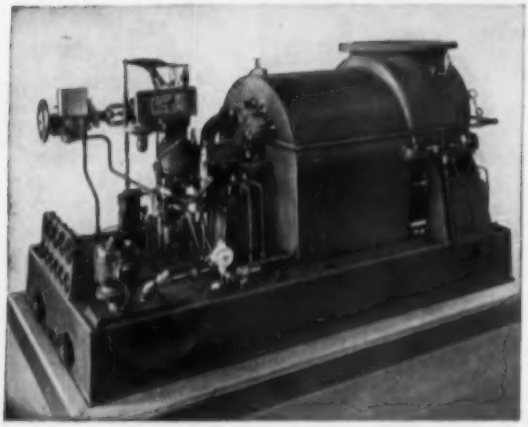


Terry high-speed, high-horsepower turbine on continuous compressor-drive service at National Petro-Chemicals Corporation.

Hedrich-Blessing photo

At National Petro-Chemicals Corporation . . .

Terry high-speed compressor-drive turbines provide continuous 'round-the-clock service



One of the two 5400 hp., 7486 rpm turbines built for the Tuscola plant of National Petro-Chemicals Corporation.

In the fall of 1953, five Terry multistage turbines were placed on day-and-night duty at the Tuscola, Illinois, Plant of National Petro-Chemicals Corporation. They drive high-speed compressors used to compress hydrocarbon gases in the production of ethylene.

The *excellent performance of these initial units later resulted in the installation of two more Terry machines.* These were placed in service some two years later.

In all, the seven turbines total more than 30,000 hp. They range in capacity from 3300 to 5400 hp., and in speed from 7500 to 9700 rpm.

The National Petro-Chemicals installation, and the thousands of other units serving in refineries and chemical plants throughout the world, are testimony to the low maintenance and consistent reliability of Terry turbines. Put Terry to work for you. Write for further information.

THE TERRY STEAM TURBINE CO.

TERRY SQUARE, HARTFORD 1, CONN.

TERRY

REPUBLIC'S JOB

at Kyger Creek:

control five 1,400,000 lb./hr. boilers — automatically

Kyger Creek Power Plant of the Ohio Valley Electric Corp. is big—*a million kw capacity at 7 lb. steam per kwhr.* And its job, supplying the U.S. atomic program, is one of the most important in the world. Republic's job: Control each of the five 1,400,000 lb./hr. boilers *automatically*.

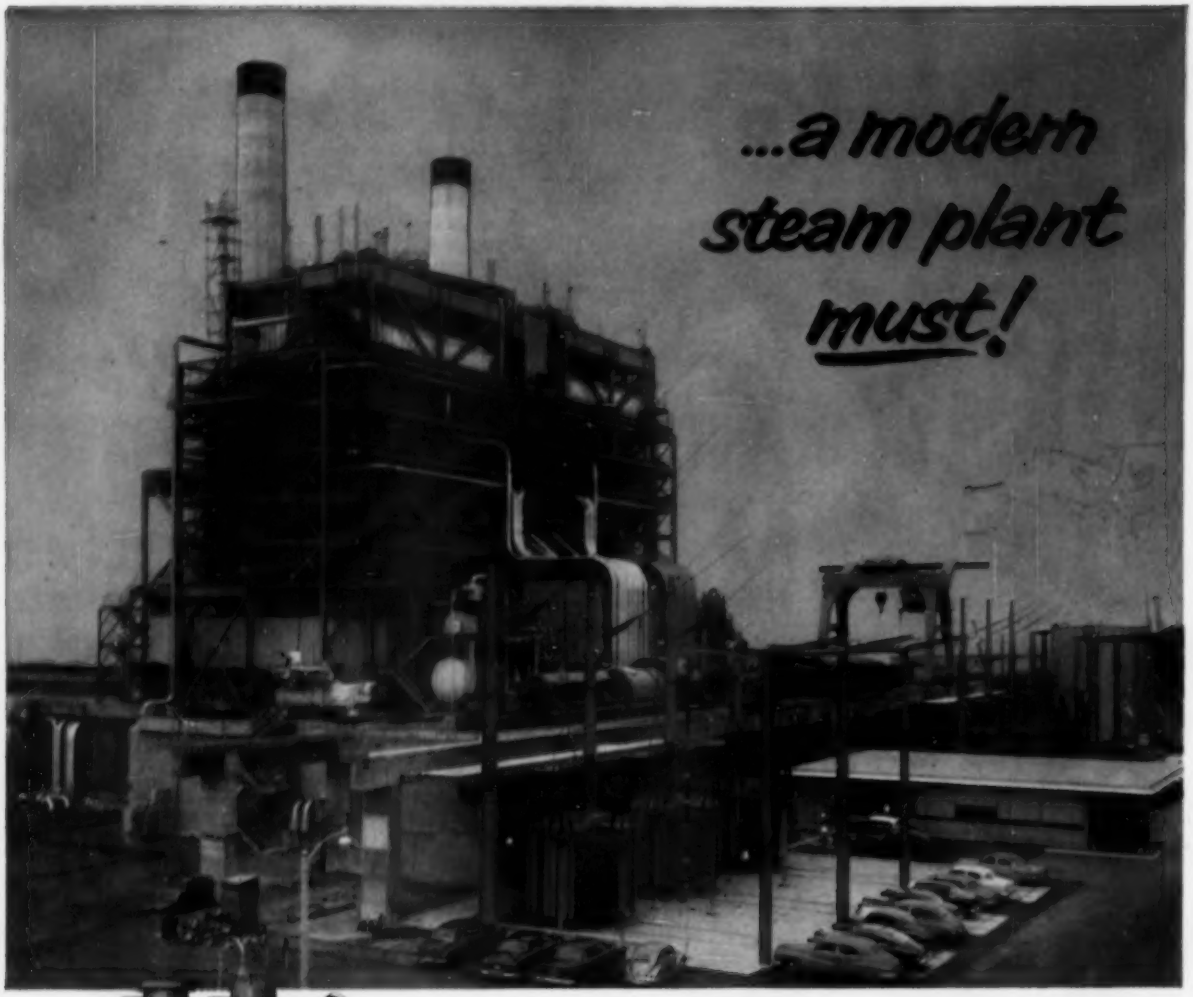
Republic's solution provides each boiler with a *load*-sensing combustion control, a follow-up *pressure* control, and an "Electronic Master". In operation, a change in steam flow (load) is detected and initiates a proportional adjustment of air and fuel flow *before the load change can change boiler pressure*. Should pressure tend to drift up or down, the follow-up control detects it and modulates the fuel/air control signals accordingly. The "Electronic Master" integrates all measured data and master-loads the unit's pneumatic power operators. It also provides adjustable automatic division of total fuel among the boiler's 14 burners in the desired proportions, and permits manual operation.

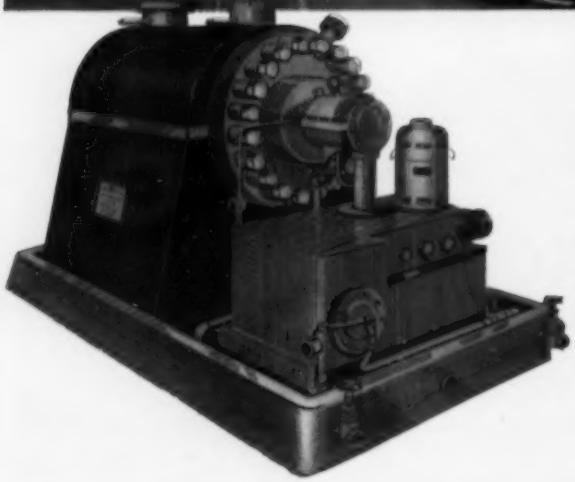
Perhaps your plant is smaller; perhaps it supplies process steam instead of feeding 200,000-kw turbines. Whatever the size or duty, Republic's experience (30 years of it) can help you get maximum stability and efficiency from your major equipment. *Always* check plans with Republic; our engineers can save you trouble and expense throughout the life of your plant.

REPUBLIC FLOW METERS CO.

A Subsidiary of Rockwell Manufacturing Company

2240 Diversey Parkway • Chicago 47, Illinois





PACIFIC BOILER FEED PUMPS

CONTINUOUS POWER... a *must* in Southern California Edison's giant El Segundo steam station. Three Pacific boiler feed pumps were placed in operation for unit No. 1 in 1955. Two more Pacific pumps were selected and went on the line for unit No. 2 in 1956. The combined generating capacity of the two units is 350,000 kilowatts. These Pacifics, each delivering 685,000 lbs./hr. of 360°F. feed water at 2350 PSIG, unfailingly serve Southern California Edison's El Segundo plant needs. Whenever continuous boiler feed service is an absolute must... then nothing but the best, most dependable service will do... Pacific Boiler Feed Pumps!

Write for Bulletin 122

PACIFIC PUMPS INC.

HUNTINGTON PARK CALIFORNIA

Offices in all Principal Cities

PACIFIC

BF-26

new Misericordia Hospital will

SAVE THREE WAYS *

BY INSTALLING

FW PACKAGED STEAM GENERATORS

Lowering one of the 43,500 lb FW Packaged Steam Generators into the basement of the Misericordia Hospital.

SCHEDULED for completion early in 1958, the $8,000,000, 210-bed Misericordia Hospital, Bronx, N.Y., will be fully equipped with the finest and most modern facilities obtainable.

All steam requirements will be supplied by three fully-automatic Foster Wheeler Packaged Steam Generators, each rated 17,500 lb/hr at an operating pressure of 125 psi. Each two-pass steam generator contains 1857 sq ft of heating surface and generous furnace volume. Staggered tube arrangement permits a high heat transfer rate and low exit gas temperatures. These FW Packaged units also offer the following cost-saving advantages:

* **SAVE TIME** — because they were completely shop fabricated and delivered by truck direct to the building site, all ready to set in place and connect to power, fuel and steam lines.

* **SAVE SPACE** — because of exceptionally low ratio of unit size to quantity of steam produced. Measuring only 12'1⅛" high, 10'11⅛" wide and 16⅛' long, these 17,500 lb/hr units are installed on small, low-cost foundations.

* **SAVE MAINTENANCE** — because they are specially designed for easy servicing and inspection. Consisting almost entirely of water heating and steam producing pressure parts, there is a minimum of refractory and tile maintenance.

FW Packaged Steam Generators are available in capacities from 10,000 to 60,000 lb/hr and pressures to 1300 psi. For complete information, send for Bulletin No. PG-55-3. *Foster Wheeler Corporation, 165 Broadway, New York 6, N.Y.*

FOSTER WHEELER

NEW YORK • LONDON • PARIS • ST. CATHARINES, ONT.

A **Buell Cyclones** offer exclusive Shave-off which harnesses double-eddy currents and puts them to work, large diameter design which eliminates bridging and clogging.

B **Buell "SF" Electric Precipitator** delivers extra collection efficiency through use of unique high emission, selftensioning Spiralectrodes and exclusive Continuous Cycle Rapping.

C **Buell Combination Cyclone-Precipitator Systems** combine exclusive Buell features for extra efficiency where extremely high performance standards must be met.

Which is the best dust collection system?

Five factors influence the choice of a dust collection system: dust characteristics, gas characteristics, efficiency required, installation and operation costs, and limitations of space or draft loss. In every installation, exclusive Buell features provide *extra efficiency*. A booklet, "The Collection and Recovery of Industrial Dusts", provides valuable, specific details. Just write Dept. 80-H, Buell Engineering Company, Inc., 70 Pine Street, New York 5, New York

buell

Experts at delivering Extra Efficiency in **DUST COLLECTION SYSTEMS**

EUTECTIC Welding News

PLANT, RESEARCH LABORATORIES and WORLD HEADQUARTERS

Published by EUTECTIC WELDING ALLOYS CORPORATION 40-40 172nd STREET, FLUSHING 58, NEW YORK, N. Y.

"EUTECTIC" WELDING HEADLINES • TIME-MONEY-MACHINERY SAVERS

XYRON 2-25 REPAIRS RR DIESEL ENGINE SAVES $10,800, WEEKS OF DOWNTIME

A large break in the first cylinder of a 600 horsepower diesel engine almost resulted in the loss of $10,800 by a Midwestern railroad. Attempts to repair the engine with conventional high heat welding materials failed because the block was thoroughly dirt and oil soaked and its tremendous size made pre-heating impossible.

Fig. 1

The railroad's maintenance foreman was ready to recommend scrapping the engine when Eutectic's District Engineer suggested welding with patented Xyron 2-25, "Eutectic's" newest and most advanced electrode for all types of grey and alloyed cast iron. Xyron 2-25 is usable fast and cold and is the first non-cracking, porosity free, all position electrode for cast iron.

Fig. 2

Repair was begun by veeing out all broken surfaces with Eutec-Chamfer-Trode, high speed gouging electrode for all metals. (Fig. 1) Gouging with ChamferTrode provided a good surface for deposits of Xyron 2-25 and burnt out many of the impurities in the casting. After the broken parts were reassembled on the engine block, Xyron 2-25 was used to tack weld. (Fig. 2).

Welding machine was set at 100 amps, DC reversed. The weldor then used a stringer technique with short arc to deposit 2" passes of Xyron 2-25. Peening after each pass relieved stress and slag was easily removed.

Final results were excellent. Xyron 2-25 produced dense, smooth, porosity free deposits at lowest amperages. (Fig. 3) Fast repair with Xyron 2-25 saved railroad $10,800 replacement cost and avoided weeks of downtime. *(A-71)*

HIGHEST STRENGTH JOINTS WITH EUTECTRODE 201

Welded with patented EutecTrode 2101, the aluminum tine joints on this cement block unloader are up to three times stronger than joints of conventional aluminum electrodes. Loads of close to a ton cause the tines to dip as much as eight inches without cracking. EutecTrode 2101 quickly fabricated the block unloader, produced smooth solid deposits with good color match and high resistance to corrosion. The first aluminum electrode with an extruded flux coating, EutecTrode 2101 does not spatter or fume, produces a quiet arc at lowest amperages. EutecTrode 2101 outperforms all conventional aluminum electrodes. *(A-72)*

EUTECTRODE 680 AC-DC AVERTS 10 WEEK STOPPAGE

A Tennessee stamping plant faced an 8-10 week production stoppage because of a cracked shaft on a 340 ton press. Replacement was estimated at $15,000. But downtime was averted and replacement cost saved by using EutecTrode 680 AC-DC and Eutec-ChamferTrode to repair the shaft at a cost of only $37 in materials. Eutec-ChamferTrode, high speed gouging electrode, was first used to vee out the crack, which extended 6" through the 12" shaft. EutecTrode 680, patented high tensile electrode for very high alloy and carbon steels, was then applied. Eutec-Trode 680 welds were applied at lowest amperages. *(A-73)*

In answering industry's requests for technical data, Eutectic's research and engineering staffs help industry save thousands of dollars each year. Your questions, like those below, will be answered without obligation by Eutectic's Technical Information Service.

Q. My company's welding manual makes reference to the use of solder in the repair of lamp socket contacts. EutecRod 157 with Eutector Flux 157 was recommended to us for this application. Will you advise? We would like to incorporate this information in our manual for future use. The fact that this soldering is performed by unskilled personnel should be considered.

A. EutecRod 157 is considered an ideal recommendation. Since this alloy has an extremely narrow plastic range, rapid solidification takes place, assuring a good build-up. It is therefore easier to handle by the unskilled. Deposits are harder and have higher electrical conductivity than conventional solders. This means greater resistances to pitting and general wear. Since the alloy has a higher solidus temperature, the possibility of plasticizing the build-up if accidental arcing occurs is virtually eliminated. Contacts also will remain bright and clean since EutecRod 157 does not contain lead or other elements than darken with age. Melting point is approximately 430° F. Electrical conductivity is 18 percent.

Q. What is the electrical resistance of EutecRods 180, 800, and 1804?

A. Electrical resistivity of all three is almost identical in that values of 23/24 microhms per cubic centimeter are obtained on all tests.

Eutectic Warehouse — Service Centers
446 Northside Drive, N.W., Atlanta 18, Ga.
2204 Irving Boulevard, Dallas 7, Texas

Eutectic Welding Alloys Corporation
40-40 172nd Street, Flushing 58, N.Y.

Gentlemen:

I would like further free information on the following:

☐ A-71 ☐ A-72 ☐ A-73

☐ Free 170 page pocket Welding Data Book

Name _____

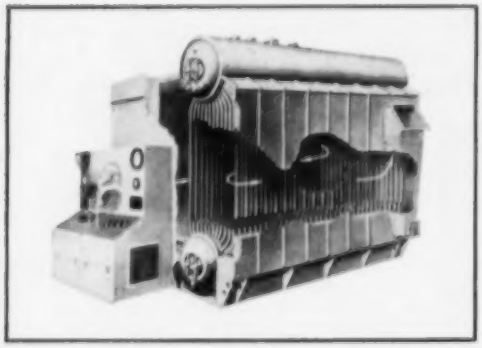
Business Address _____

City _____ State _____

EUTECTIC WAREHOUSE — SERVICE CENTER • 446 NORTHSIDE DRIVE, N.W., ATLANTA 18, GA.
EUTECTIC WAREHOUSE — SERVICE CENTER • 2204 IRVING BOULEVARD, DALLAS 7, TEXAS

Architect's rendering of the Lake Meadows project. Skidmore, Owings and Merrill, Architects.

Chicago's newest planned community is served by C-E Boilers



Cutaway view of typical VP Boiler. For capacities from 4,000 to 40,000 lb of steam per hr. Pressures to 500 psi. Oil or gas fuel.

Firing aisle of the Lake Meadows boiler room showing three of the five C-E Package Boilers, Type VP.

Located on a 100 acre site overlooking Lake Michigan, Chicago's newest planned community, the Lake Meadows project, offers gracious living within the confines of a large city. Owned and managed by the New York Life Insurance Company, Lake Meadows provides distinctively appointed apartments, spacious grounds, a modern shopping center, ample parking facilities, yet is within minutes of the heart of the city. When completed, this project will house 2000 families and will include an eight acre park. Construction has already begun on a new elementary school located on two acres adjacent to the housing development.

A project of this size requires considerable steam capacity to provide ample heat and hot water as well as to perform the many other services required. To do the job, the New York Life Insurance Company originally selected three C-E Package Boilers, Type VP. Later, as new housing units were added, two additional VP Boilers were installed. Their outstanding performance and efficient, trouble-free operation is evidenced by the repeat order placed with Combustion for the final two units.

Complete information on C-E Package Boilers is available in Catalog VP-3. Write for your copy.

COMBUSTION ENGINEERING

Combustion Engineering Building, 200 Madison Avenue, New York 16, N. Y. B-986A

Canada: Combustion Engineering-Superheater Ltd.

ALL TYPES OF STEAM GENERATING, FUEL BURNING AND RELATED EQUIPMENT; NUCLEAR REACTORS, PAPER MILL EQUIPMENT; PULVERIZERS; FLASH DRYING SYSTEMS; PRESSURE VESSELS; SOIL PIPE

LARGER SIZE RANGE

MIDWEST ELBOWS

IMPROVED DELIVERY

HEAVY WALL CARBON STEEL AND ALLOY

12" Long Radius
2¼" Wall Thickness
1¼% Chrome

20" x 10" Reducing
2" Wall Thickness
2¼% Cr—1% Mo.

STRAIGHT LONG RADIUS 90° ELLS

Nominal Pipe Size	Maximum Wall Thickness
36	1.250
30	2.000
26	2.000
24	1.500
20	1.375
18	2.250
16	2.125
14	1.750
12	2.000
10	2.000
8	1.750
6	1.000
5	.625
4	.750
3	.625
2½	.375
2	.500

These straight elbows can be furnished with LONG TANGENTS at no extra cost. All thicknesses less than those shown above are, of course, available.

The exclusive Midwest method of making all welding elbows from plate instead of tubing gives us a FLEXIBILITY OF MANUFACTURE that is much greater than by any other process. These heavy wall Midwest straight and reducing elbows are available in any material that can be secured as plate. The maximum wall thicknesses for which we now have equipment are indicated by the tables at left and right. And, because it is easier to get plate than tubing, better delivery is another advantage. Still another is the close tolerances inherent in our process.

Quality control goes beyond all code requirements. The longitudinal weld of every heavy wall elbow is completely X-rayed as standard procedure in our method of manufacture.

You will find it to your advantage to send us your inquiries.

REDUCING LONG RADIUS 90° ELLS

Nominal Pipe Size	Maximum Wall Thickness
30	2.000
26	*
24	2.000
20	2.000
18	2.000
16	1.500
14	1.750
12	2.250
10	2.000
8	1.750
6	1.000
5	.625
4	.750
3	.625
2½	.375
2	.500

Reductions to all nominal pipe sizes down to ½ large diameter. All thicknesses less than those shown above are, of course, available.
*Refer to factory.

MIDWEST PIPING COMPANY, INC.

Main Office: 1450 South Second St., St. Louis 4, Mo. • Plants: St. Louis, Clifton, N. J. and Los Angeles

Sales Offices

ASHEVILLE (BOX 446, SKYLAND, N.C.) CHICAGO 3—79 WEST MONROE ST. HOUSTON 2—1213 CAPITOL AVE. NEW YORK 7—50 CHURCH ST.
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MIAMI 34—2103 LE JEUNE RD. SAN FRANCISCO 11—420 MARKET ST.

STOCKING DISTRIBUTORS IN PRINCIPAL CITIES

7673

COMPLETE LINES OF WALWORTH VALVES for POWER PLANT SERVICE

Featuring Walworth Pressure-Seal Valves

Here are cast steel valves built for high-pressure, high-temperature service. The unique bonnet-to-body design utilizes internal line pressure for a tight, leakproof connection. The higher the pressure the tighter the bonnet joint! Bulky, heavy bonnet flanges, bonnet studs, and nuts are completely eliminated providing a modern valve design of truly streamlined proportions. Maintenance is simplified as Walworth Pressure-Seal Valves are easily assembled, disassembled, and insulated.

Walworth Pressure-Seal Valves are available in Series 600, 900, 1500, 2500, and in a wide range of sizes and types. Complete information is available from your nearby Walworth Distributor—or—write Walworth for for a free copy of Circular 16.

and including these valves for "*'round-the-plant*" use!

WALWORTH SMALL CAST STEEL Y-GLOBE VALVES. Simplified design eliminates many of the problems encountered in high-temperature, high-pressure service. No bonnet joint. Improved back-seat design means longer life for packing rings.

WALWORTH LUBRICATED PLUG VALUES. Easy turning—quick operating. Lubricant can be renewed while the valve is in service. Lubricant completely surrounds the plug ports for a tight seal against leaks. Remember, always use Walworth Lubricant in Walworth Lubricated Plug Valves.

WALWORTH BRONZE VALVES. Standardized lines of bronze valves provide an unsurpassed system of interchangeability of parts, drastically reducing inventory problems. Walseal Valves with brazing ends also available in a variety of types.

WALWORTH IRON BODY GATE VALVES. Straight-flow port design reduces fluid turbulence to a practical minimum. Seat rings of end-seated type are screwed into the body. Brass liner on glands assures greater resistance to corrosion and scoring. Available with threaded or flanged ends.

WALWORTH CAST STEEL GATE VALVES. Bolted bonnet, wedge gate, OS&Y. Bonnets and bodies are engineered to withstand pressure and minimize distortion. Heavy steel walls provide extra strength and longer life. Deep stuffing boxes in all sizes (2" to 24") insure tightness and maximum packing life. Also available in globe and angle types.

WALWORTH also offers Plastic Valves, Fittings, *and* Pipe of polyvinyl chloride, moulded to Walworth's specifications by General American Transportation Company of B. F. Goodrich Chemical Company Geon!

WALWORTH

Manufacturers since 1842

valves . . . pipe fittings . . . pipe wrenches

60 East 42nd Street, New York 17, N. Y.

Walworth Company of Canada, Ltd., Toronto

DISTRIBUTORS IN PRINCIPAL CENTERS THROUGHOUT THE WORLD

Greenlee cuts steam costs 18%-20% burning coal the modern way

Consult an engineering firm

Designing and building hundreds of heating and power installations a year, qualified engineering firms can bring you the latest knowledge of fuel costs and equipment. If you are planning the construction of new heating or power facilities—or the remodeling of an existing installation—one of these concerns will work closely with your own engineering department to effect substantial savings not only in efficiency but in fuel economy over the years.

facts you should know about coal

In most industrial areas, bituminous coal is the lowest-cost fuel available • Up-to-date coal burning equipment can give you 10% to 40% more steam per dollar • Automatic coal and ash handling systems can cut your labor cost to a minimum. Coal is the safest fuel to store and use • No smoke or dust problems when coal is burned with modern equipment • Between America's vast coal reserves and mechanized coal production methods, you can count on coal being plentiful and its price remaining stable.

Expanding facilities at Greenlee Bros. & Company, Rockford, Illinois, created a problem common to many growing firms. The Company's three old boilers had to operate continually at maximum capacity, so that a forced outage could hurt plant production. In addition, peak load operation with outmoded equipment resulted in high fuel costs.

While the newest boiler was retained, Greenlee replaced the other two with modern high-capacity units, including stokers, up-to-date controls and other equipment for more efficient operation. A new, pneumatic ash handling system was installed. Today Greenlee is getting 10%-20% more steam for each pound of coal burned and steam costs are down 18%-20%, saving Greenlee thousands of dollars every year.

For further information or additional case histories showing how other plants have saved money burning coal, write to the address below.

BITUMINOUS COAL INSTITUTE

Southern Building • Washington 5, D. C.

this is what it takes
to give you
dependable air...

Packaged Air-Cooled Compressors—
½ through 20 horsepower
Other Compressors to 6000 Horsepower

You can't minimize the importance of a reliable source of compressed air.

Ingersoll-Rand Compressors are designed and built for maximum performance with minimum maintenance.

If your plant is in need of an air-cooled compressor in the ½ through 20 horsepower range . . . don't gamble, make sure you get the *Best*.

Ingersoll-Rand

11 Broadway, New York 4, N.Y.

3-494

News (Continued)

Walworth — Southeast

M. H. Luttrell, former Southeastern Division Manager for the **Walworth Company** has been appointed General Sales Manager with headquarters in New York City.

Robert E. Engley succeeds Mr. Luttrell as Southeastern Division Manager with headquarters at 1600 Southland Circle, N.W., Atlanta, Georgia. **A. M. Cornell** is now Assistant Manager of the Southeastern Division.

Robert Conway, Jr., is now Manager of Pulp and Paper Mill Sales, headquartering at Baton Rouge, Louisiana.

International Nickel — N. C.

The appointment of **Dr. Thomas P. May** as Manager of the **International Nickel Company's** Kure Beach-Harbor Island Testing Station on the North Carolina coast near Wilmington has been announced by **F. L. LaQue**, Vice President and Manager of the Development and Research Division. Dr. May will transfer his headquarters from New York to the station. The Kure Beach-Harbor Island station, where research is conducted on the behavior of materials in salt water and sea air, is recognized as the most extensive project of its kind in the world.

Dr. May had served since August, 1954, as Technical Manager of the station. Harry T. Paterson, who died May 27 last, was resident Operational Manager. Dr. May's new position combines both technical and operational management of the station.

Dr. May joined the Corrosion Engineering Section of Inco's Development and Research Division in New York in 1947 after serving for eight years as head of the Corrosion Section, Chemistry Division, U. S. Naval Research Laboratory, Washington, D. C.

A Director of the National Association of Corrosion Engineers, Dr. May is also a member of the American Chemical Society, the Electrochemical Society and the American Society for Metals. He is the author of several books.

(*Continued on page* 68)

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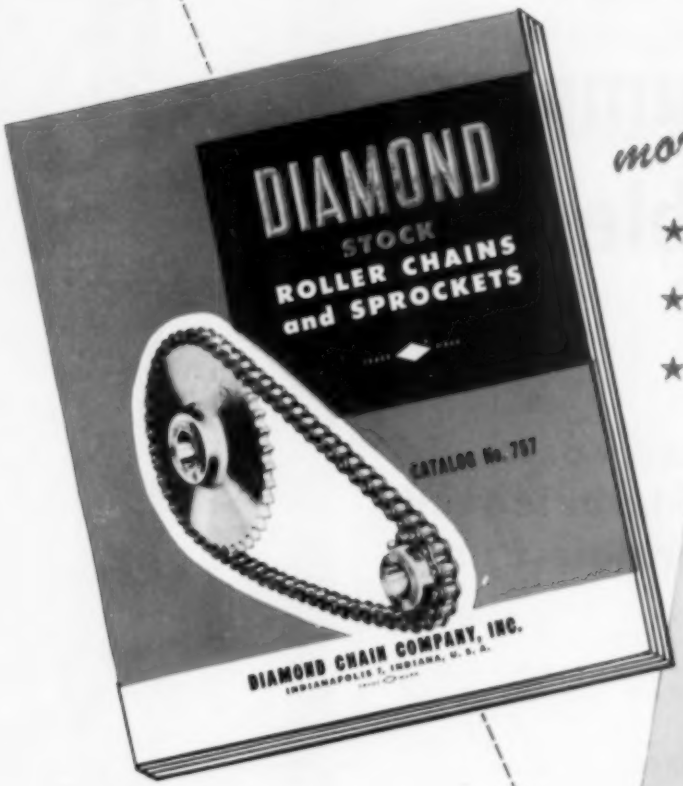

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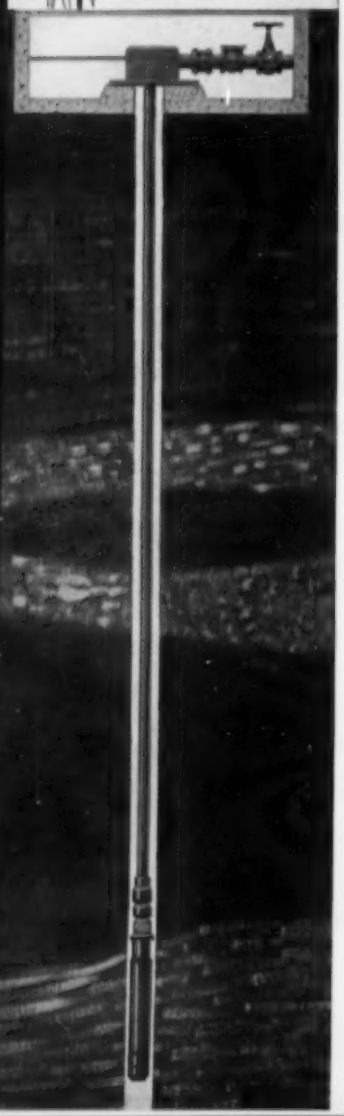

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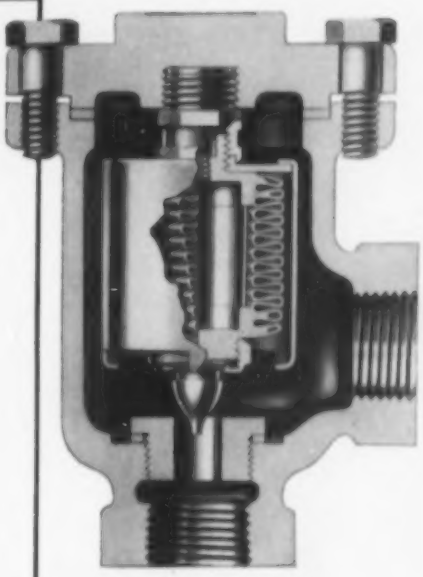

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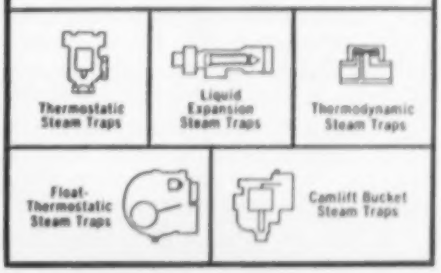

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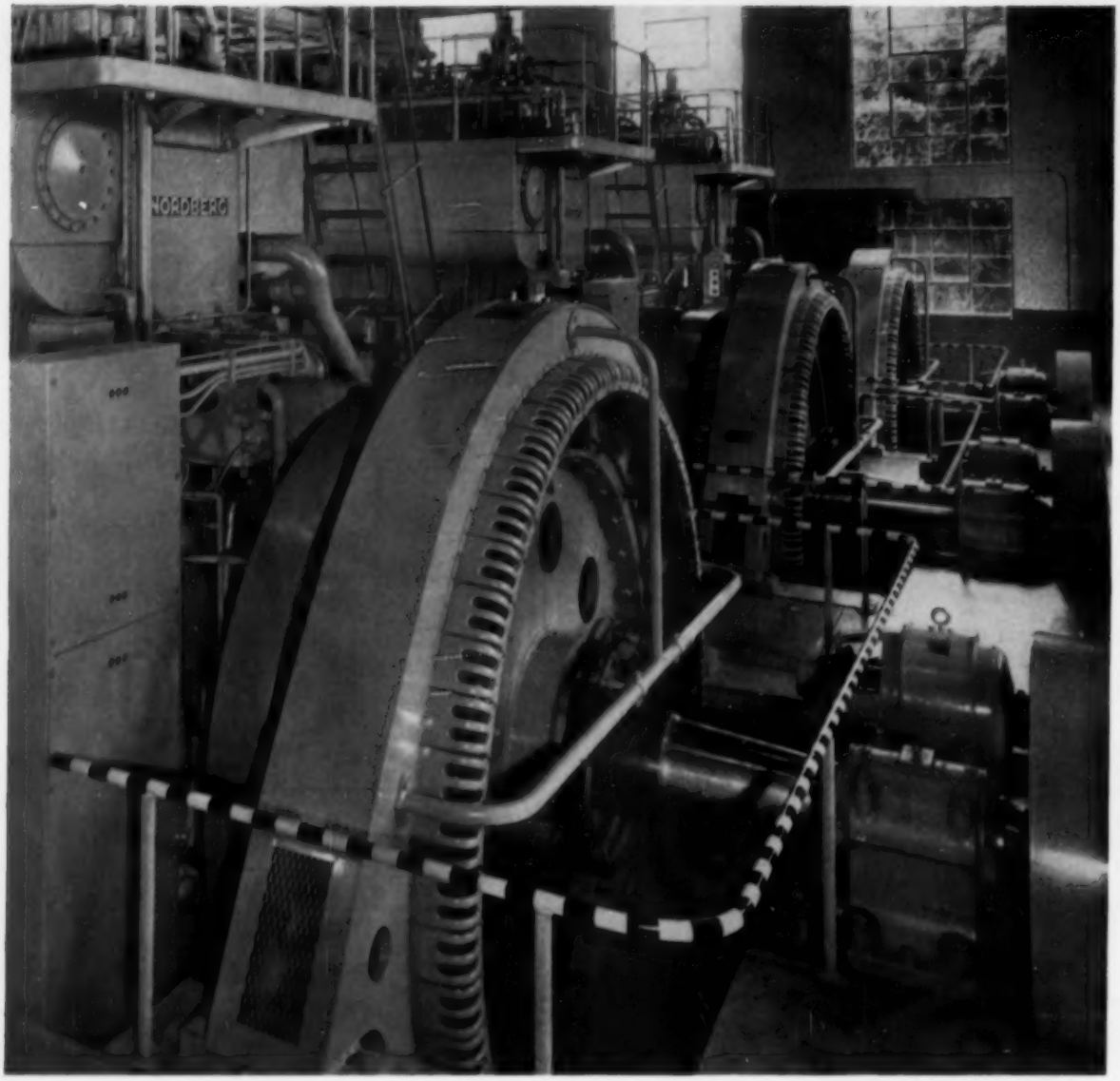

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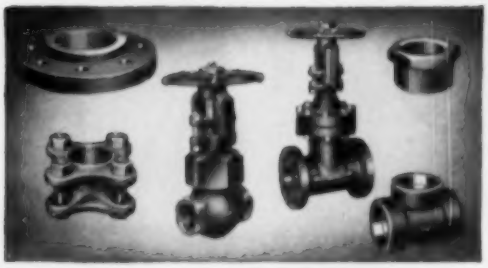

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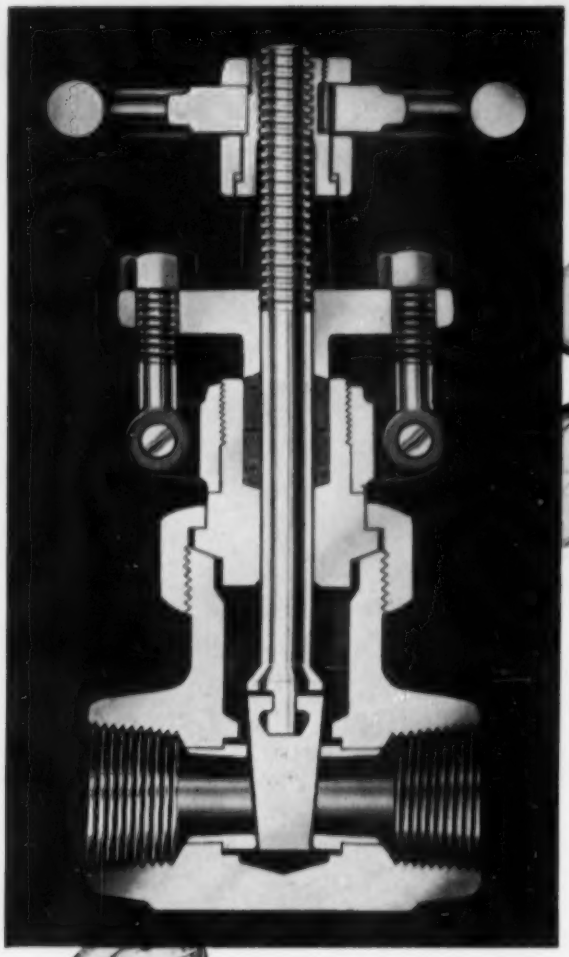

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Sizes for Chapman List 960 range ¼" to 2". With rising stem with yoke or with rising stem with inside screw. Bonnet joint is either gasketed or ground metal to metal, as you prefer.

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TIMELY COMMENTS

Tell Them How-To-Do-It

CASH AND DIAMONDS for Ideas! "I've got a million of 'em," you say. Maybe so, but they will never be turned to profit as long as you keep them to yourself.

All plant men (workers, foremen and managers) should realize that the man-on-the-job can come up with hundreds of profitable solutions to plant problems. Many companies offer prizes and bonuses for suggesting improvements, and others feel that these suggestions should be made as part of regular duty.

Both points of view have merit. But the important thing is to provide open channels for the flow of ideas — and a bit of recognition certainly helps.

Temco Aircraft Corporation in Dallas goes whole hog on promoting employees' suggestions and pays good money for ideas accepted. Roy Barr of Temco's assembly department was recently awarded the first three-diamond "Tem McThrifty" emblem ever given a Temco employee. This award signified that 20 or more of his ideas have been accepted.

In addition to pins, Temco employees receive cash awards, and, in some cases, additional bonuses. During 1956, company employees received $25,280 in cash, plus bonuses, for suggestions.

Your Lighting Dollar

ONLY ONE out of ten industrial and commercial buildings is lighted to even minimum standards of the Illuminating Engineering Society. What's the situation in your plant? The importance which lighting plays in today's industrial plant certainly justifies intelligent consideration of the many details involved.

Moreover, the investment in fixtures, lamps, wiring, maintenance and operation demands that the plant manager or authorized individual have some knowledge of what constitutes good lighting.

With this knowledge and an appreciation of what good lighting does — that it is a tool for production and a factor in employee efficiency and morale — plant engineering personnel can make the most effective and economical use of the lighting dollar spent in the plant.

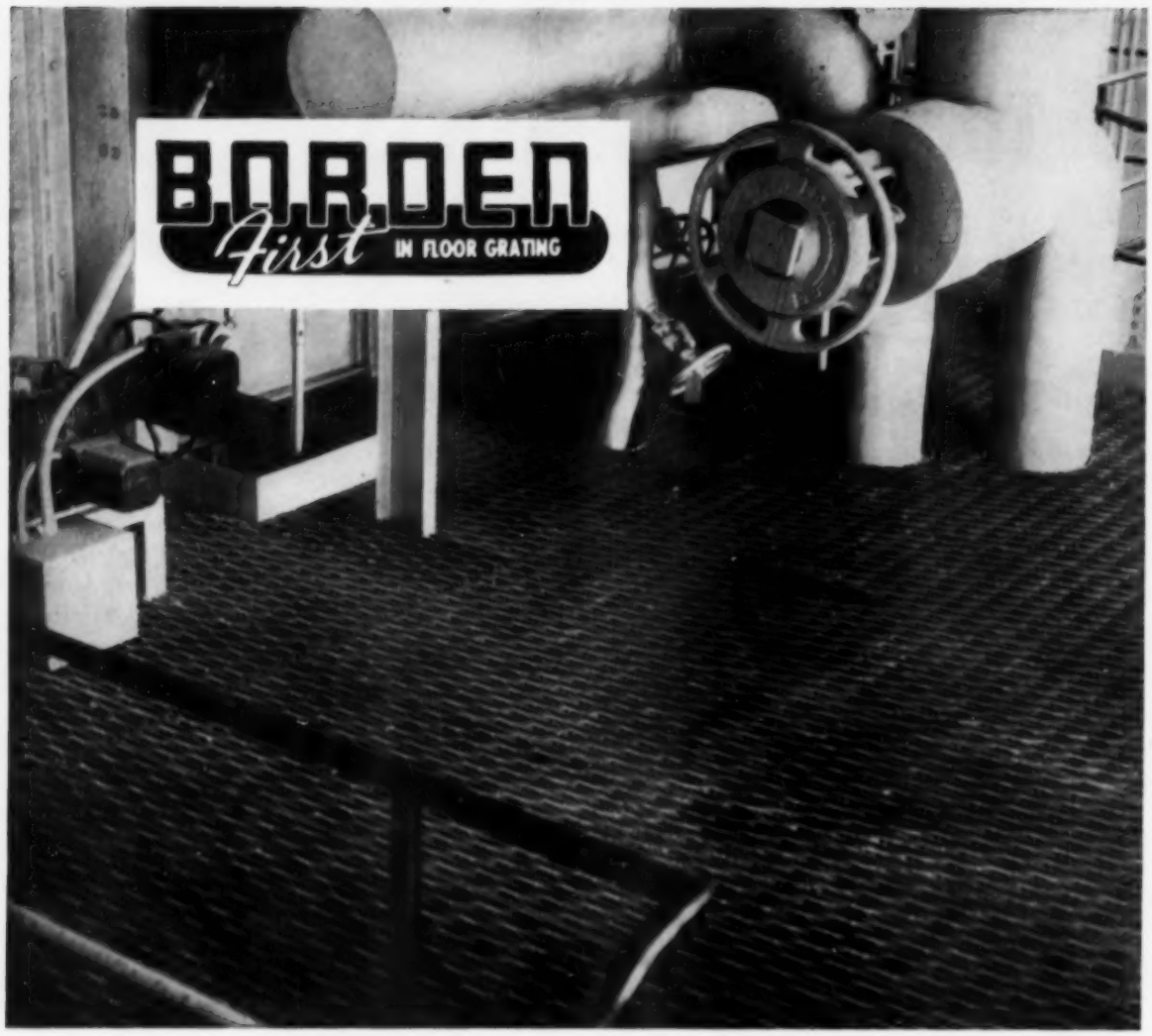
To help plant managers, superintendents and engineering department heads in Southern & Southwestern manufacturing, process and utility plants, SPI, during the coming months, will publish 13 feature articles on: GOOD LIGHTING — A TOOL FOR PRODUCTION.

1. Introduction — size, brightness, contrast and time — July
2. What is Good Lighting — August
3. Planning Good Lighting
4. Right Lamp for the Lighting Job (Fluorescent)
5. Right Lamp for the Lighting Job (Incandescent)
6. Paint and Lighting
7. Cost of Good Lighting
8. Good Lighting and Safety
9. Special Applications
10. Protective Lighting
11. Industrial Offices
12. Wiring

SUMMARY — CHECK-LIST ON "GETTING THE MOST FROM YOUR LIGHTING DOLLAR"

These thirteen feature articles are written exclusively for SPI by Roy A. Palmer of the Duke Power Company, Charlotte, N. C. Mr. Palmer is one of the South's leading authorities on lighting applications.

Remember that good seeing conditions can contribute to improved production in your plant. Your lighting system and its maintenance is on a par with efficient, labor-saving machines. It is a tool for production. Check SPI's feature articles and discuss your lighting problems with your associates.



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INDUSTRY SPEAKS

Develop Versatility

BECAUSE of the growing complexity of modern industry, management more and more is seeking versatility from the engineer, according to Willard F. Rockwell Jr., president, Rockwell Manufacturing Company.

Operation of an industrial enterprise is complex — and getting more complex each year, says Mr. Rockwell. Because of this, it is becoming harder and harder to draw lines of differentiation or responsibility between skills, professions and departments.

"Once the cry was for specialty, now the need is for versatility," says Mr. Rockwell. All too frequently, he adds, the engineering aspects of a company.

"But today he must deal with sales, marketing, cost accounting, public relations, and other departments and sections."

Straight-Forward Approach Needed — Management people expect the engineer to work with them in the same straightforward way he deals with engineers and engineering problems. If people in the company "hate to talk to the Engineering Department" or if Engineering develops the reputation of "looking down its nose" at non-engineering matters, management and the company suffer — and the engineer suffers.

Ostensibly, the engineer bases his conclusions on objective facts rather than on the shakier foundation of subjective opinions. At any rate that is one of his objectives — and for that reason he is valuable to management; because management, too, seeks objectivity in making decisions and drawing conclusions. Management assumes that the information obtained from the engineer can be considered in the class of "objective facts."

Must Preserve Objectivity — To properly serve management, the engineer must strive to retain his objectivity, even at the risk of being unpopular or disliked. For in the long run, he will be respected, which is far more important.

More than others in a company, the engineer must be ready to dissent, if the facts as he knows them so dictate. It is not for him to ingratiate himself by readily agreeing. It may be that factors of which the engineer has no knowledge make it desirable to follow a different course. But the engineer should still stick to his evaluation as he knows the facts.

"Management can then be confident, when it asks for advice or opinions from engineering, that it will get the best analysis the engineer can give, based upon his work and knowledge."

Technical Tempo Accelerating — The shortage of engineers today is a reflection of the fact that the tempo of the technological revolution in industry is rapidly increasing, he adds. Even excluding the companies and industries that, by and large, serve the defense needs of the country, there is more engineering going into production of goods and services than ever before.

In addition, the engineering approach is becoming more and more prevalent in sales strategy planning and broad marketing plans; operations research and systems planning are affecting accounting practices, materials handling, distribution, etc. This means that the engineer has more opportunities to rise rapidly in management.

"Management has the responsibility to provide the engineer with opportunity to advance, to produce, and to participate to the extent of his abilities and on an equal footing with others in the organization. But the engineer also has a responsibility to management which he must discharge if he expects his career with a specific company to be successful."

Management can only go so far in providing the engineer with the means to gain added knowledge and develop skills and abilities in his profession. The engineer must be willing to invest his time and effort to take advantage of the opportunities offered and to seek others.

Learning On "Own Time" — An engineer should continue a certain amount of formal education, he says. But even more important is his informal education — the learning and doing on his own. This includes keeping up with technical and trade magazines and other publications; active membership in important trade and technical societies and associations; preparation of papers and articles.

SPI's Consultant on Atomics Describes Another First for the South

Atomic Trends

Nuclear Power in Virginia

By JOHN F. LEE, Professor
of Mechanical Engineering
North Carolina State College

Fig. 1. View of core structure in Army Package Power Reactor.

NUCLEAR POWER came to the South on April 29, 1957, when the 2035 kw Army Package Power Reactor (APPR) was dedicated at Fort Belvoir, Virginia.

Among the nation's first nuclear power plants to go into service, it is unique because it is the first completely integrated generating plant using the pressurized water concept. It is also the first of a series being developed by the U. S. Army and the Atomic Energy Commission.

Alco Products, Inc. built the power plant under a contract with the Atomic Energy Commission. The original design for the reactor was developed at Oak Ridge National Laboratory. General Electric Company furnished the conventional generating equipment under a subcontract with Alco. Stone & Webster Engineering Corporation was retained by Alco, under a subcontract, as general consultant and erector.

Technical Description

In general, operation of the plant can be divided into two systems—primary and secondary (see Figure 3). The principal difference from a conventional power station lies in the primary system, where the heat is supplied by nuclear reaction. Components in the APPR's secondary system closely approximate, on a small scale, those employed in a power generating plant using conventional fuel.

Primary System

The main components of the APPR primary system are: (1) the reactor vessel and core, (2) control rods and drives, (3) two coolant circulating pumps, (4) piping, (5) the steam generator, (6) a pressurizer, (7) water purification equipment, and (8) shielding.

The reactor core forms the heart of the system. Housed in the core are 38 fuel elements, containing fully enriched uranium, together with control rods — all in a grid structure of a basic 7 x 7 arrangement with the corners missing (Figure 2).

Cooling water enters the reactor vessel at 431 F under a pressure of 1200 psi to prevent boiling. While

circulating upward between the fuel plates at 4,000 gpm, it is heated to 450 F before passing to the steam generator.

At the steam generator, heat from the high-pressure primary water is transferred to the water in the secondary system, thus producing the steam used to drive the turbine.

The cycle is completed by using special Westinghouse "canned-rotor" pumps to return the cooled primary water to the reactor. The two pumps are constructed primarily of 304L stainless steel and are similar to pumps used in the submarine Nautilus.

Secondary System

The secondary system of the APPR is comprised essentially of the secondary side of the steam generator, the turbine-generator, surface condenser and auxiliaries, feedwater heater, evaporator, pumps and storage tanks.

Since no primary water is circulated in the secondary system, no shielding is required and the entire secondary system, except the steam generator, is outside of the vapor container. In this system, steam is produced in the steam generator at 34,070 lb/hr under a pressure of 200 psi at 407 F.

The steam, which has 25 F superheat, passes through the turbine to a surface de-aerating condenser and back to the steam generator through a feedwater heater.

Feedwater for the steam generator is obtained from a condenser hot-well and circulated by the combination condensate hot-well and boiler-feed pump through a closed-type feedwater heater. In the feedwater heater the temperature of the water is raised to 250 F by steam bled from the turbine at about 35 psia.

Reactor Details

The reactor core consists of 38 fuel rods and 7 control-rod assemblies fabricated by the Oak Ridge National Laboratory. The core and its supporting structure are housed in the stainless steel-clad reactor vessel built by ALCO. The vessel measures 47½ in. ID and 162 in. over-all length and is clad with 0.125 of an inch of stainless steel on all surfaces in contact with primary water.

The fully enriched, uranium-dioxide fuel is incorporated into flat-plate type elements. Each fuel assembly consists of 18 fuel plates brazed into a pair of 304L stainless steel side plates 27 in. long, 2.863 in. wide and 0.050 in. thick. The outside plates are 27 in. long, and the internal plates are 23 in. long. Each assembly has on both ends a 304L stainless steel grid adapter, or end box, attached by fusion welding.

The control rods consist of two sections: a fuel section, and an ab-

SUPPLIERS OF PRINCIPAL EQUIPMENT

PRIMARY SYSTEM	
Reactor Vessel and Control Rod Assembly	Alco Products, Incorporated
Pressurizer	Alco Products, Incorporated
Steam Generator	Alco Products, Incorporated
Canned Rotor Pumps	Westinghouse Electric Corp.
Stainless Steel Piping	Tube Turns
Fuel Elements	Oak Ridge National Laboratory
Control Rods	Oak Ridge National Laboratory
Vapor Container	Bethlehem Steel Company
SECONDARY SYSTEM	
Demineralizers (2)	General Ionics Corporation
Steam Turbine	General Electric Company
Generator	General Electric Company
Condenser	Lummus Company
CONTROL SYSTEMS	Minneapolis-Honeywell Regulator Co.

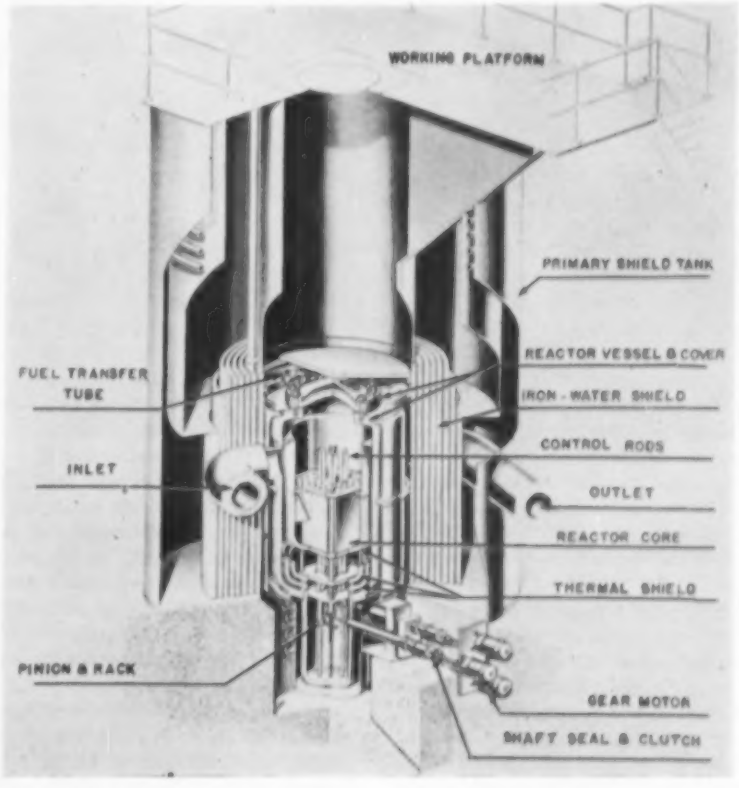


Fig. 2. Isometric drawing of the reactor vessel, core and control rod structure in the Army Package Power Reactor.

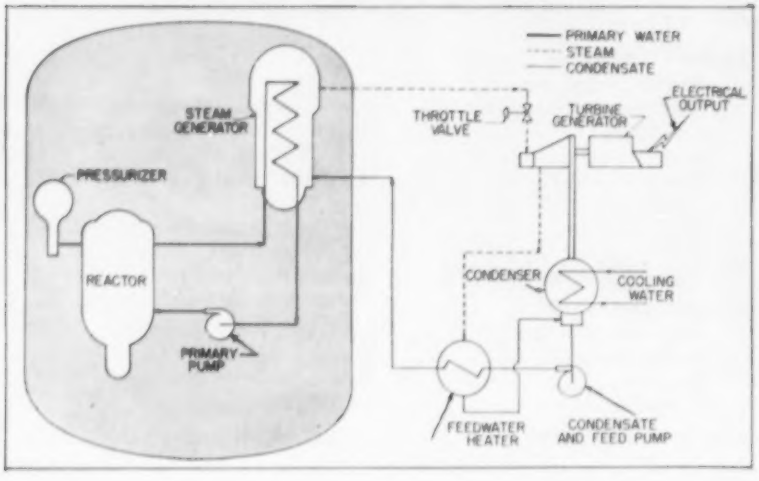


Fig. 3. Shaded portion shows the primary (reactor) section of plant, and unshaded portion shows the secondary (conventional) section.

sorber section. Control-rod fuel plates are fabricated in the same manner as the stationary fuel plates. The absorber section is boron enriched in the isotope boron-10.

The ALCO-built steam generator has a "U"-type bundle with 326 tubes each ¾ in. OD by 0.062 in. wall, with a total effective heating surface of 836 sq ft. Inside the same shell, separated from the generating section by a baffle plate, is the superheater section, with 194 sq ft of heating surface. Hence, the total heating surface of the generator is 1030 sq ft.

The steam generator receives slightly radio-active water at 450 F from the primary system, while secondary water at 250 F enters the shell side about halfway up the steam-generating section at a full-load rate of 34,270 lb/hr.

The secondary water is converted to steam by contact with the tube bundle, which contains the heated primary water. This secondary-system steam is used to drive the turbine in the secondary side of the plant.

Type 304L stainless is used as the basic corrosion-resistant material in the steam generator. In addition, all piping (provided by Tube Turns) in the primary system is of solid stainless steel, of ¾ in. wall thickness and 12¾ in. OD. The 1200 psi operating level of the primary system is maintained by two immersion heaters housed in a stainless-clad pressurizer built by ALCO.

The pressurizer, which is 45 in. ID and mounted on a cylinder 16 in. ID by 54 in. long, contains sufficient steam and liquid to absorb fluctuations of primary liquid volume without excessive pressure changes.

Water in the primary system is thoroughly purified to protect against corrosion. The primary system contains about 1,300 gallons of water which is circulated at a rate of about 4,000 gpm. This water is maintained at a total solid concentration of not more than 2 ppm.

Portions of the water in the primary loop are removed and purified, in two demineralizers furnished by General Ionics Corp., each 42 in. high, 12 in. in diameter, and containing about 2 cu ft of resin. As a contamination safeguard, the resin and and the demineralizer unit containing it will be periodically removed and discarded.

When the water leaves the demineralizers, it contains no more than 0.5 ppm of total solids. After passing through a micro-metallic filter, it enters a 5,000 gallon stainless steel primary-water tank for recirculation to the primary loop.

The primary shield is a 156 in. diameter steel tank filled with water and containing eight concentric steel cylinders (Figure 2). Each cylinder is 2 in. thick and the cylinders are separated by an inch-thick layer of water. The innermost cylinder also functions as the inner wall of the tank and as a support for the pressure vessel. An iron-water shield was selected because it weighs less, is smaller than an equivalent concrete shield, and permits faster fabrication on the site.

The secondary shield — 5 ft of concrete — was designed so that the dose rate will be less than 1.5 milliroentgens per hour at any point outside the vapor container at building level. This dose rate is much less than allowable laboratory tolerance. Two feet of the secondary-shield concrete are inside the vapor container wall with an additional 3 ft on the outside of the container shell from ground level to a height equal to that of the control room roof.

The vapor container, which houses the primary system and the steam generator, is a combination steel and concrete structure 32 ft ID and 64 ft in height. It was fabricated by the Bethlehem Steel Corporation from ⅞ in. thick steel ring segments, and has both spherical ends and cylindrical section lined with two feet of reinforced concrete.

The inner surface of the 2 ft thick inside concrete shield is lined with a light-steel plate shell which prevents contamination of the concrete liner and facilitates cleaning in the event of an accident.

Power Equipment

A Hagan three-element regulating valve is provided in the feedwater connection to the steam generator. Close regulation of conditions in the steam generator and the secondary system in general is maintained by adjusting the blow-down.

The steam from the steam generator is channeled to the General Electric 2500 kw turbine-generator.

The Lummus condenser has a two-pass, divided water box, single tube-sheet arrangement. Tubes are sealed to the tube sheet with 50/50 solder and then rolled into serrated tube-sheet holes.

The APPR uses one low-pressure ALCO feedwater heater operating at system design of 29.9 psia. Heat is channelled to the feedwater from a steam-bleed point in the turbine.

The strong negative temperature coefficient of the APPR makes it a very stable system. The Minneapolis-Honeywell instrumentation and controls were designed to take full advantage of this stability. Process controls in the plant are similar to those used in a conventional steam-power installation.

Startup of the APPR is manually controlled in coordination with indications from electronic pulse-counting channels. The instrument channels monitor the neutron flux from the source level to an intermediate range of power to insure safety in startup. Detectors in these channels are the boron-trifluoride and fission chamber types. Compensated ionization chambers serve as the detecting elements for neutron flux, covering power levels from intermediate range to 150% of rated plant power.

Three identical ion-chamber channels are provided in the safety circuit. These have the main function of "scramming" the reactor if the power should reach unsafe levels. Scramming is accomplished by release clutches holding the control rods out of the reactor core during operation. The clutches are released electronically, and very rapidly, in response to high neutron flux level, and the rods drop by gravity, thereby inserting the boron poison that shuts down the reactor.

Two of the three safety channels must agree that scramming is required to preclude a "scram-happy" condition of operation. This is called a "coincident" circuit.

A final, period channel is provided to prevent dangerous runaways. This channel, instead of merely responding to the absolute power level or neutron flux, responds to the rate of increase of power level and scrams the reactor when that rate reaches abnormally high values.

The over all construction cost of the entire project is estimated at $3,500,000.

Plastic Templates for Paint Masks

ONE HEADACHE in a job shop producing metal specialties is the high cost of setting up paint operations requiring extensive masking. This problem faced Jacksonville Metal & Plastics Co., Jacksonville, Florida, when they received some airline contracts for the manufacture of scheduling boards.

The panels consist of metal strips, 81" long x 3" wide, blanked from 18 gauge hot rolled sheet. A simple forming operation makes a narrow channel, and uniform hole spacing simplifies the only other machine operation.

When it comes to the paint finish, however, the trouble begins: The entire strip is painted a matte black. This is no problem . . . but the black strip must then be striped with ¼" color bands, set 3" apart. The bands are to be painted in sequence . . . red, blue, green, and yellow and a ⅛" green stripe is then to be painted along the bottom edge.

The answer was found in a template made from plexiglas (clear acrylic plastic) sheet, designed to permit spray painting of 4 stripes of the same color at one pass of the gun. The template automatically masks all areas in between. A single locating pin which slips into the pre-drilled, uniformly spaced holes, provides precision alignment and assures complete accuracy.

Here are some of the major advantages found in the use of plexiglas paint masks:

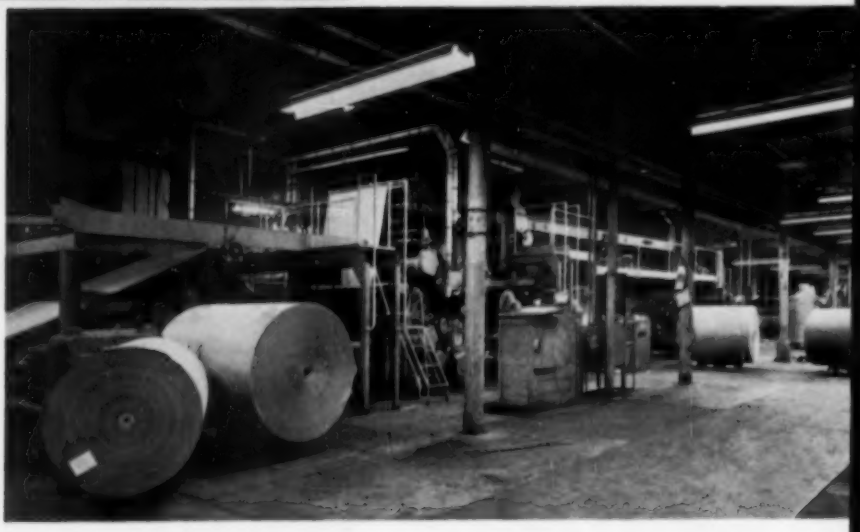
1. The soft texture is easy on the finish . . . no scratches or nicks.
2. The smooth surface and flatness of the plexiglas sheet minimizes smearing possibilities.
3. The see-through feature of clear acrylic plastic, although not important in this application, has been found very helpful in other masking jobs.
4. Plexiglas masks are easily cleaned with commercial solvents.
5. Plexiglas masks are simple and inexpensive to fabricate to any desired shape or contour.

By George Black (Fla.)

AFTER — Compare the up-to-date lighting below with the old system at left. Well distributed high level illumination provides fast, easy seeing. General lighting provided by fixtures which permit upward light creates a pleasant atmosphere. The illumination here measures **35** foot-candles. An 80-foot length of continuous reflector on each side of the machine provides **70** foot-candles where operators need to check the process.

BEFORE — Old lighting in the plant of Old Dominion Box Company. Note spots of direct and reflected glare, poor distribution and low level of illumination. The atmosphere here is not conducive to efficiency and safety.

Photos Ed T. Simmons, Winston-Salem.



What Is Good Lighting?

Part 2 — Lighting Required for Various Jobs

By ROY A. PALMER
Duke Power Company
Charlotte, North Carolina

HOW MUCH LIGHT should we have? Standards of levels of illumination are issued by the Illuminating Engineering Society and lamp manufacturers. Various seeing tasks require different levels depending upon the details that must be observed. Thus, these standards can serve as a guide to the amount of illumination desirable according to the state of the lighting art at the time of the publication of those standards.

If we would refer back to standards of 35 years ago, we would find that a level of illumination of 10 foot-candles was considered good for a machine shop or similar industrial activity. A few years later, the levels rose to 15 foot-candles. Subsequently, they increased to 25, 30 and 50 foot-candles and today, many industrial plants have 75 to 100 foot-candles for general illumination.

It may seem preposterous to predict that general illumination of the order of 200, 500 and 1000 or even higher foot-candles will be specified in tomorrow's standards, but experimental installations already indicate that such levels are both feasible and justifiable.

The steady rise in levels of illumination has been due to several developments. The new light sources which have come on the market year after year have provided more light for the current consumed. For example, the fluorescent lamp which appeared in 1938 doubled the light output per kw over that of incandescent lamps. Since then, improvements in fluorescent lamps have further increased light output several

times over their predecessors. Today, mercury lamps are being used in some industrial plants. Their efficiency has been increased and their color has also been improved, making them more acceptable for industrial application.

With the development by lamps which provide more light, there has been much activity among lighting equipment manufacturers to provide fixtures which shield the lamps to avoid undue brightness and which distribute the light effectively. Consequently, a great variety of equipment is available to serve most types of lighting needs.

When we are startled by the mention of greater quantities of light for our plants, we should consider that we still have a long way to go when we compare those quantities with daylight. Our demand for more and better light is instinctive, perhaps because of the abundance of nature's illumination outdoors. On a summer day, sunshine will provide as much as 10,000 foot-candles.

Of course, we wouldn't think of putting a milling machine, lathe, loom, or other machine in the sunshine because the brightness would be too extreme. Yet, we read a paper or book with a high degree of comfort in the shade of a tree or in the open on an overcast day where the illumination may range from 1000 to 5000 foot-candles. This level not only provides sufficient illumination for safe and easy seeing, but also for a very pleasant environment, both of which are important in the industrial plant to help build employee efficiency and morale.

Thus we can appreciate the fact that good illumination requires a large volume of light plus low brightness. A well - engineered lighting system will provide this together with a level of illumination consistent with present day standards, as well as economy of installation and operation for the specific needs of various areas of a plant.

In making a study of any industrial lighting operation, it must first be determined what the worker has to see. Since the visual tasks in a plant cover a wide

RECOMMENDED LEVELS OF ILLUMINATION

The table shows the level to be maintained, not just initial values. Figures are from a General Electric Company, Lamp Division bulletin.

ASSEMBLY	
Rough	50
Medium	100
Fine	200
Extra Fine	500
INSPECTION	
Rough	50
Medium	100
Fine	200
Extra Fine	500
LABORATORIES	
General	50
Close Work	200
OFFICES AND DRAFTING ROOMS	
Conference Rooms	50
Corridors and Stairways	20
General Offices	50
Intermittent Close Work	70
Bookkeeping and Accounting	100
Continuous Close Work	150
PAINTING	
Dipping, Spraying, Ordinary Hand Painting and Finishing	30
Fine Hand Painting and Finishing	70
Extra Fine Hand Painting and Finishing	150
POWER PLANTS, ENGINE ROOMS, BOILERS	
Boilers, Coal and Ash Handling, Storage Battery Rooms	10
Auxiliary Equipment, Switches, Transformers, Engines, Generators, Blowers, Compressors	30
Switchboards and Meters	100
REPAIR SHOPS	
Rough Bench and Machine Work	50
Medium Bench and Machine Work	100
Fine Work — Buffing, Polishing, etc.	200
Extra Fine Work	500
SERVICE AREAS	
Corridors and Passageways	20
Elevators and Stairways	20
Locker Rooms	20
Toilets and Washrooms	20
Employee Parking Areas	2
SHIPPING AND RECEIVING	30
STORAGE AND STOCKROOMS	
Rough Bulky Materials	10
Medium	20
Fine Material Requiring Care	50
WAREHOUSE	10
TESTING	
Rough	50
Fine	100
Extra Fine Instruments, Scales	200
WOODWORKING	
Rough Sawing and Bench Work	50
Planing, Sanding, Medium Machine and Bench Work	100
Fine Bench and Machine Work and Finishing	200

This photograph illustrates some features of good lighting installation of Charlotte Linen Service, Charlotte, N. C. Adequate shielding of reflectors guards against undue brightness in operator's eyes. Openings in reflectors permit upward light to illuminate ceiling (compare with first illustration in this article). Light tone of floor adds to pleasant atmosphere. A high level of illumination, **50** foot-candles, with low brightness assures easy seeing.

range of shapes of objects, their size and the contrast with surrounding areas, considerable skill may be necessary to specify lighting.

Where high levels of illumination are required, care must be exercised to guard against glare. While it is quite impossible to cover the many industrial lighting needs in detail, a few general considerations will assist the plant manager or superintendent to better understand his lighting requirements.

Two Systems

There are two forms of lighting systems used in industrial plants.

1. General
2. Local or supplementary

The entire work area should be illuminated generally, to provide good seeing at every point as well as to assure freedom from excessive contrasts, glare or heavy shadows and to provide a pleasant atmosphere throughout the room.

Where the seeing task requires considerable concentration or is relatively detailed, a local lighting system is needed to provide a high level of illumination. Such systems should be well designed to direct the light on the work and so shielded that no annoying glare will disturb a worker at another part of the room. Flexible units are therefore not generally satisfactory, because one worker may adjust the unit to suit him at his particular location but at the same time throw glare on the work of other workers in the field of the exposed lamp.

When we are working at a given task which is illuminated to a high level, our eyes are adapted to that illumination. Invariably, we look up from our task from time to time. If the surrounding area is relatively dark, our eyes must adapt themselves to that lower brightness, only to re-adapt again when looking back at the well illuminated work. Constant change in adaptation of the eye over a period of time may cause eye-strain and fatigue, thereby lowering the worker's efficiency.

Generally, the ratio of brightness between the task and immediate surroundings should not exceed 3 to 1, and 10 to 1 between the task and more remote surfaces. Thus, the general lighting levels are sometimes governed to a considerable extent by the local lighting intensities.

Where there are raw materials or partially completed products which have shiny surfaces which reflect light sources or other bright areas in the eyes of workers care should be used to diffuse light sources so that annoying reflections can be minimized.

Shadows are useful in deter-

mining the shape of objects but if they are uncontrolled, they may conceal physical hazards or they may be distracting to the worker thus delaying his operation or unnecessarily using his energy. While the latter may seem trivial, it nevertheless can become quite significant over a period of time. In a drafting room, experience shows that the lighting should be so well diffused as to eliminate shadows.

Paint plays a very important part in lighting. Dark colors not only absorb light but also create a dingy, gloomy atmosphere. Light colors on the other hand, reflect light and add to the cheerfulness of the room. Light floors are highly desirable.

The use of color in industrial plants is on the increase, particularly on machines. Light tones on milling machines, drill presses and other machines improve visual comfort by lowering brightness contrasts. The use of color on walls is usually desirable to create a pleasant atmosphere. Light tones should always be used, dark, heavy colors avoided. Ceilings should always be painted flat white.

The lighting equipment for general lighting in industrial plants up to a few years ago was of a direct type which emitted light only in a downward direction. Today, fixtures are designed to permit some upward light to illuminate the ceiling. This eliminates dark ceilings which produce a "tunnel" effect in the room. It also relieves the brightness between the fixture and the ceiling, improving visual comfort.

The importance which lighting plays in today's industrial plant justifies intelligent consideration of the many details involved. Moreover, the investment in fixtures, lamps, wiring, maintenance and operation demands that the plant manager or authorized individual have some knowledge of what constitutes good lighting.

With this knowledge and an appreciation of what good lighting does — that it is a tool for production and a factor in employee efficiency and morale, he can make the most effective and economical use of the lighting dollar spent in his plant.

Newport News, Virginia . . .

Plastic Face Shields Restored

A QUICK DIP through acetone, which restores plastic face shields, was an idea which brought P. C. Bledsoe a $1,000 suggestion award from Newport News Shipbuilding and Dry Dock Co.

The face shields, valued at over $1, are provided for use in painting, chipping and grinding operations throughout the huge shipyard. Previous practice called for the shields to be discarded after limited use.

Bledsoe's suggestion, as simple as the paper clip and about as hard to "invent," provides a quick dip through acetone for the scarred shields. The softened plastic quickly flows back into shape when the guard is air dried. Annual savings have been estimated at around $12,000.

Gas Turbine Performance . . .

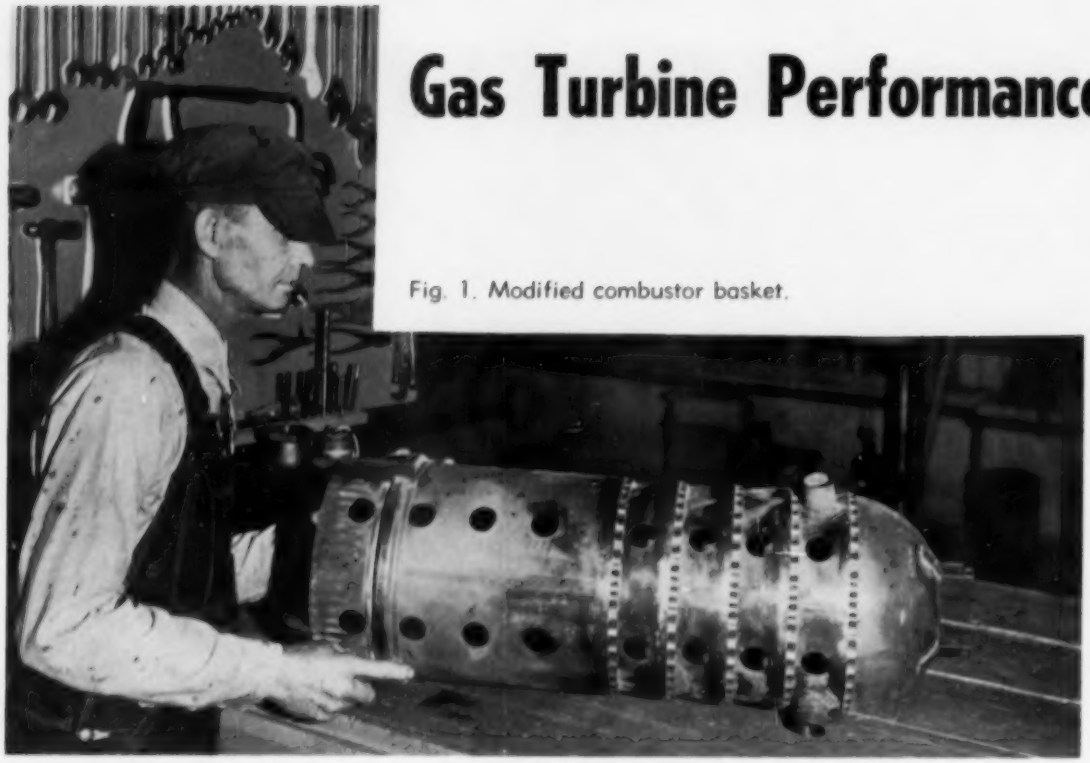


Fig. 1. Modified combustor basket.

PART 2 – MAINTENANCE

A SUMMARY of West Texas Utilities Company's gas-turbine generating experience covering operation and maintenance during the period between December, 1952 and March, 1957. (Part I on Operation was presented in the July issue of *Southern Power and Industry*.)

THE Fort Stockton Unit (an independent plant) and the Girvin Unit (located in an old steam plant) have been overhauled at approximately yearly intervals since installation and our plans are to continue this schedule. Both units are 5000 kw simple-cycle gas-turbines coupled directly to axial flow air compressors. The generators are driven through reduction gears at 3600 rpm. See July SPI, page 36 for more complete description.

Fort Stockton Unit

The annual Fort Stockton overhaul is accomplished under the supervision of a manufacturer's field engineer, by the four plant operators plus two mechanics from the steam plants and about four laborers hired locally for the overhaul period. It has not been found necessary to work more than one shift per day during the overhaul periods, however 9 and 10 hour days are worked at times.

It should be pointed out that the overhaul outage time for both units include considerable materials delay time. The remote location of these units with respect to manufacturer's facilities along with the manufacturer's and customer's inexperience with this type of equipment largely explains these delays in repair and replacement of equipment.

The Fort Stockton unit has been base-loaded since it was installed late in 1952.

THE FIRST Fort Stockton annual overhaul started in December 1953 and required 43.5 days to complete. The inspection showed all equipment to be in good condition except the turbine where spot welds had broken, Fig. 3, allowing some of the stationary seals to pass through the unit. The damaged blades on the spindle were repaired in the field except for part of the third row which were replaced. The stationary blade diaphragms were returned to the factory for repair.

Modified design combustor baskets and fuel nozzles were installed. Figs. 1 & 4. Also new starting equipment, which included wound-rotor induction motor, speed increaser, and pneumatic clutch, was installed to replace the original starting equipment.

The Magnaflux Corporation was called in to examine the turbine blades, cylinder, spindle, coupling, gears, journals, exhaust-bearing support and pinion quill shaft. No failures were indicated by the Zyglo tests.

THE SECOND annual overhaul occurring in February, 1955 required 18 days. The turbine spindle and blades were in good condition according to the Zyglo

. . . 4-Year Report

Fig. 2. View of Fort Stockton spindle, compressor blades at left.

By A. R. COX
Production Department
West Texas Utilities Company
Abilene, Texas

test. Stationary blade segment No. 1 (Fig. 3) had 27 blades which showed cracks running from the outlet edge toward the inlet edge, ranging in length from ⅛ to 1½ in. This complete segment had been repaired at the previous overhaul because of the mechanical damage and since it had about 14,000 hours operation and an expected life of 20,000 hours, a new segment was fitted and installed.

There were a few cracks in the combustor basket spot welds (Fig. 5) as shown by Zyglo tests. An average of 2 bolt holes per interconnect flange on the combustor baskets were worn thin.

THE THIRD annual overhaul of the Fort Stockton unit was started in January, 1956 and lasted 32.5 days. All turbine blading was inspected for cracks by the Zyglo test. There were 27 cracks in the stationary blading and also mechanical damage caused by interconnector bolts going through the turbine. The cracks were about evenly divided among the blade segments. These cracks were on the outlet edges of the blades adjacent to the outer tips and were ground out where possible. In no case was a crack over ⅛ in. in length. All welds were free of cracks.

The compressor blading, Fig. 2, was in good condition; there was very light erosion on the first three rotating rows.

The turbine-spindle blading was clean. Two blades in the first row were cracked in the outlet edges. These cracks were ⅛ in. in length and were apparently not caused by mechanical damage. Five additional first-row blades and one second-row blade were cracked and bent by mechanical damage when combustor interconnect bolts passed through the turbine (see next paragraph). These eight blades were replaced.

All of the combustor baskets were in good condition and they were reinstalled after repair to the interconnector flange-bolt holes where the bolts had worn them thin. Twelve bolts that had worn in two and had gone through the turbine along with the holding springs were replaced with larger size bolts.

THE FOURTH annual overhaul of the Fort Stockton unit started in January 1957. At that time the unit had operated over 30,000 hours. The turbine and compressor spindle was shipped back to the factory. The very thorough inspection that followed revealed the turbine bolted disc rotor with the curvic type coupling between discs to be a basically sound design. The first three stage discs made of 19-9 chromium-nickel alloy showed no signs of deterioration. However the fourth and fifth stage discs made of ferritic material had developed cracks and were replaced with the higher grade alloy used in the first three stages.

Some of the first row spindle blades had thermal cracks in the outer half of the blades. Even though a partial first row blade replacement might have carried the unit another year it was decided best to completely replace all first row blades while the spindle was in the factory.

Experience to date indicates a life of 30,000 hours or more for the first row of spindle blades.

The first row stationary blades were replaced after about 16,000 hours operation. This confirms previous experience which indicates

a life of about 20,000 hours for the first row of stationary blading.

Girvin Unit

The Girvin gas-turbine annual maintenance overhaul is accomplished by the plant repair crew under the supervision of the manufacturer's field engineer. Five men work on the turbine and four on auxiliaries.

THE FIRST overhaul was more of a modification and inspection outage after 5 months operation which required 15 days time.

The first-stage nozzle partitions were inspected through the combustion chambers. No cracks were visible and the partitions appeared to be in good condition. The trailing edges of all partitions were slightly scalloped or crescent shaped over a radial distance of ¾ in. to a maximum depth of 1/16 in. This is considered normal erosion.

The combustion-chamber liners and caps were in good condition; no cracks or warpage was found. The fuel nozzles were dirty with carbon build-up. This condition, if carried far enough, could result in reduced load and unequal temperature distribution.

The lube-oil system and lube-oil pumps were checked thoroughly to make sure that low lube-oil pressure, when the unit was coasting down, was not caused from equipment malfunctioning. Nothing mechanically wrong could be found and all evidence seemed to indicate that the problem was one of air entrainment.

THE SECOND annual overhaul was in October, 1955 and required 10.5 days to complete.

A visual inspection was made of the first-stage nozzle partitions by viewing through the combustion chambers. The trailing edges of all partitions had the scalloped effect increased to a distance of 1 in. and a maximum depth of ⅛ in. A red dye and sonic check revealed no defects on either of two stage wheels.

The fuel nozzle portholes were dirty due to gas deposits. Periodic plant maintenance on the nozzle is required. The combustion chambers were inspected and found to be in satisfactory condition with no signs of burned spots, warpage or cracks.

THE THIRD major overhaul of the Girvin unit was in May 1956 when the manufacturer recommended air-compressor modifications of the inlet guide-vanes and first-stage rotor blades. The modifications were recommended on the basis of experience with similar units with 10,000 hours operation. Whatever the cause of the guide-vane failures, an immediate program was initiated to change the natural frequencies of the guide-vane assembly so that it is no longer in resonance with the first-stage rotor blades. This was accomplished by installing a shroud band on the tips of the inlet guide-vanes and shot peening the vanes and rotor blades in the region of attachment.

Conclusions

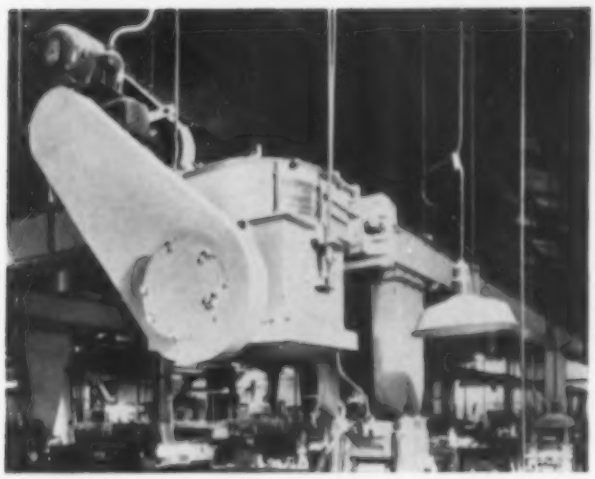
The forced outages of both the gas-turbine units have been due largely to control and relay troubles. It is felt that these controls and relays will be improved to better withstand the operating conditions of heat, vibration and dirt in a gas-turbine power plant.

The maintenance costs for the two gas-turbines were higher this year. However, the average maintenance costs over the years compares very favorably with those of medium to small steam plants.

Fig. 4. Modified fuel nozzles.

Fig. 3. Stationary blade segment.

At Florence, Alabama . . .



Efficient CLAY HANDLING

3 tons per hour . . . . . dust free operation

CLAY TAKES a quick trip from boxcar to finished ceramic tile at Stylon Southern Corporation's Florence, Alabama, plant. At full capacity, 20,000 sq ft of colorful glazed tile stream from two huge kilns each day. Back in boxcars, the transformed clay moves to national markets.

Clay, blended with talc and other ingredients, is delivered to inside storage tanks by a Z-type Redler unit (Stephens-Adamson Mfg. Co.). It moves from blenders to storage at a rate of 3 tons per hour, with the Redler's sealed casing a guarantee against dust.

Once inside the steel storage tanks the tile mix becomes very tricky. Packed solid one moment, it is likely to begin flowing like water the next. To prevent this condition and provide a steady flow of material, S-A circular bin dischargers have been installed in the bins. Rotating arch breaker arms prevent material from "handing up" on the bin walls and a series of fingers feed the clay to a circular trough where it is moved to the discharge point by solid web flights.

From the dischargers the mix falls to a sidepull Redler conveyor which follows a rectangular path 130 ft long by 10 ft wide. Through twelve discharge points the mix falls to tile presses which turn out the various shapes and sizes of tile. An application of glaze and a trip through the kilns and the tiles are ready for sorting and packaging.

Redler unit is hung from roof members by light rods. Side-pull Redler delivers to presses through open discharge points and simply recirculates material if it is not taken off. Casing is completely sealed to prevent spread of dust in production area.

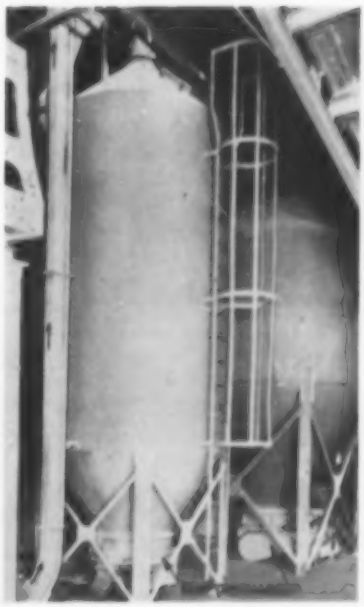


Photo at Right — Z-type Redler unit picks up material from mixer and delivers it to either of two storage tanks. Chain operated rack and pinion gates control flow of material. S-A two stage circular bin dischargers insure steady flow of material from bins to distributing conveyor on floor below. Redler unit handles 3 tons per hour.

Texas Employee Wins Top Award

Temco Aircraft Corporation's Vice President for Operations, Vernon N. Ferguson, left, congratulates Roy Gene Barr of Grand Prairie, Tex., for winning a three-diamond pin in the company's suggestions program. Barr was the first of more than 10,000 employees who had 20 different suggestions approved. For submitting ideas about how to do jobs better, easier, cheaper, safer or faster, Barr also received cash awards.

Cash and Diamonds

CASH AND DIAMONDS for ideas!

"I've got a million of 'em," you say. Maybe so, but they will never be turned to profit as long as you keep them to yourself. All plant men (workers, foremen and managers) should realize that the man on the job can come up with profitable solutions to plant problems. Many companies offer prizes and bonuses for suggesting improvements, and others feel that these suggestions should be made as part of regular duty. Both points of view have merit. But the important thing is to provide open channels for flow of ideas — and a bit of recognition certainly helps.

Recognition at Temco in Dallas . . .

Temco Aircraft Corporation, Dallas, Texas goes whole hog on promoting employees' suggestions and pays good money for ideas accepted.

Roy Gene Barr put his ideas to work and has just been awarded the first three-diamond "Tem Mc-Thrifty" emblem ever given a Temco employee.

Barr's award signified that 20 or more of his ideas have been accepted. The three-diamond pin was presented to him by Vernon N. Ferguson, Temco Vice President for Operations, who congratulated him on being the first of more than 10,000 employees to reach the 20 mark.

Altogether, Barr has received $460 in initial cash awards, plus four emblems previous to the top three-diamond emblem just awarded.

While Barr is far ahead of others in the number of suggestions accepted, eight others received one-diamond pins and personal praise from Ferguson for having 10 or more suggestions accepted, and are now aiming at the two diamonds given for 15.

In addition to the pins, Temco employees receive cash awards, and, in some cases, additional bonuses. During 1956, company employees received $25,280 in cash, plus bonuses, for suggestions.

Barr had his first three suggestions rejected in 1952. But he persisted and had one approved in 1952, another in 1953, and a third in 1955. Last year, he hit the jackpot 13 times and already this year has had four ideas accepted.

His ideas covered a wide field. They included plans for better jigs to improve manufacturing operations; methods for loading and handling major aircraft sections; safety platforms for workmen; substitution of one material for another, and better location of some of the equipment.

The highest single prize last year was $725 awarded to R. H. Mayne of the Grand Prairie plant, who suggested a method of melting huge kirksite dies.

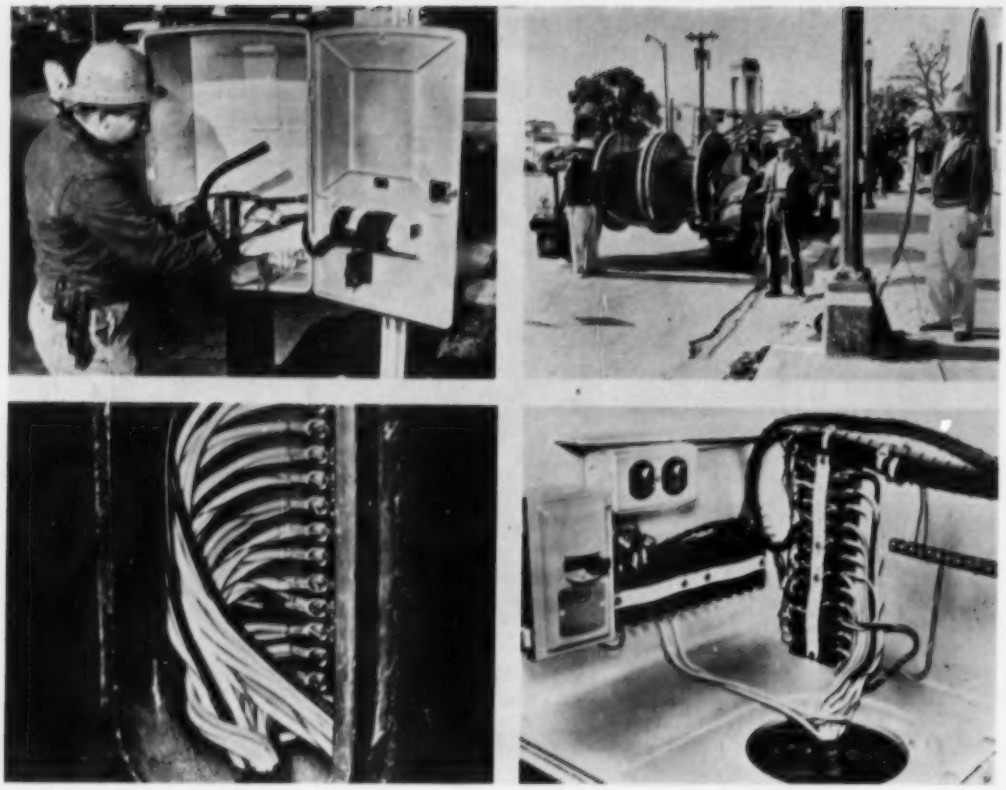
Another man's suggestion eventually won a total of $775. Clayton Glaspy of the Greenville plant developed a faster method of draining fuel tanks on C-54 military transports. His idea won a $500 bonus for being the best submitted at Temco's three plants during 1956.

BEACON COAL

EASTERN GAS AND FUEL ASSOCIATES

PITTSBURGH • BOSTON • CLEVELAND • DETROIT • NEW YORK
NORFOLK • PHILADELPHIA • SYRACUSE

For New England: New England Coal & Coke Co., For Export: Castner, Curran & Bullitt, Inc.



San Antonio Engineers Simplify Cable Installation

SPLICES ELIMINATED

INSTEAD of using splices in an intricate new traffic control system, City Public Service Board of San Antonio, Texas is tieing in cable to terminal blocks (top left photo) in an effort to reduce installation time of the cable.

The multi-conductor signal cable, which has been pulled up to 110 feet through two-inch conduits, is insulated with Bakelite polyethylene and jacketed with Bakelite vinyl plastic. The smooth outer jacket and the high tensile strength of the cable, a product of John A. Roebling's Sons Corporation, speed up installation.

Before adopting this system, city engineers toured various cities in different sections of the country, studying existing traffic control system. Superior electrical characteristics and high tensile strength (top right photo) as well as resistance to moisture and weathering make polyethylene resins outstanding for underground systems of this type. The durable cable provides protection against oil drainage and resists attack by acids and alkalies in underground ducts.

Terminal block (bottom left photo) is mounted in steel pole. Dimensional stability and ease of fabrication make production savings possible over conventional insulators. Compounds based on Bakelite vinyl resins used as an outer jacket are extruded directly over the insulated cable. The smooth outer surface permits installation crews to pull cable into ducts and conduits with ease.

Adoption of the new control cable provides high insulation resistance and excellent dielectric strength. Its low dielectric constant means small line loss and improved transmission. In addition polyethylene resins insulate the cable against electric discharge that may be caused by adjacent power cables or electrical equipment. Bright permanent colors on the individual conductor jackets simplify wire identification (bottom right photo).

COLOR-PORT

water level gage

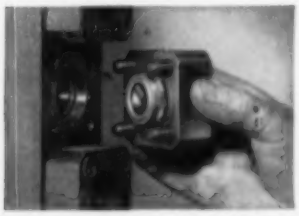
gives you . . . two-color readings . . . low maintenance . . . increased availability

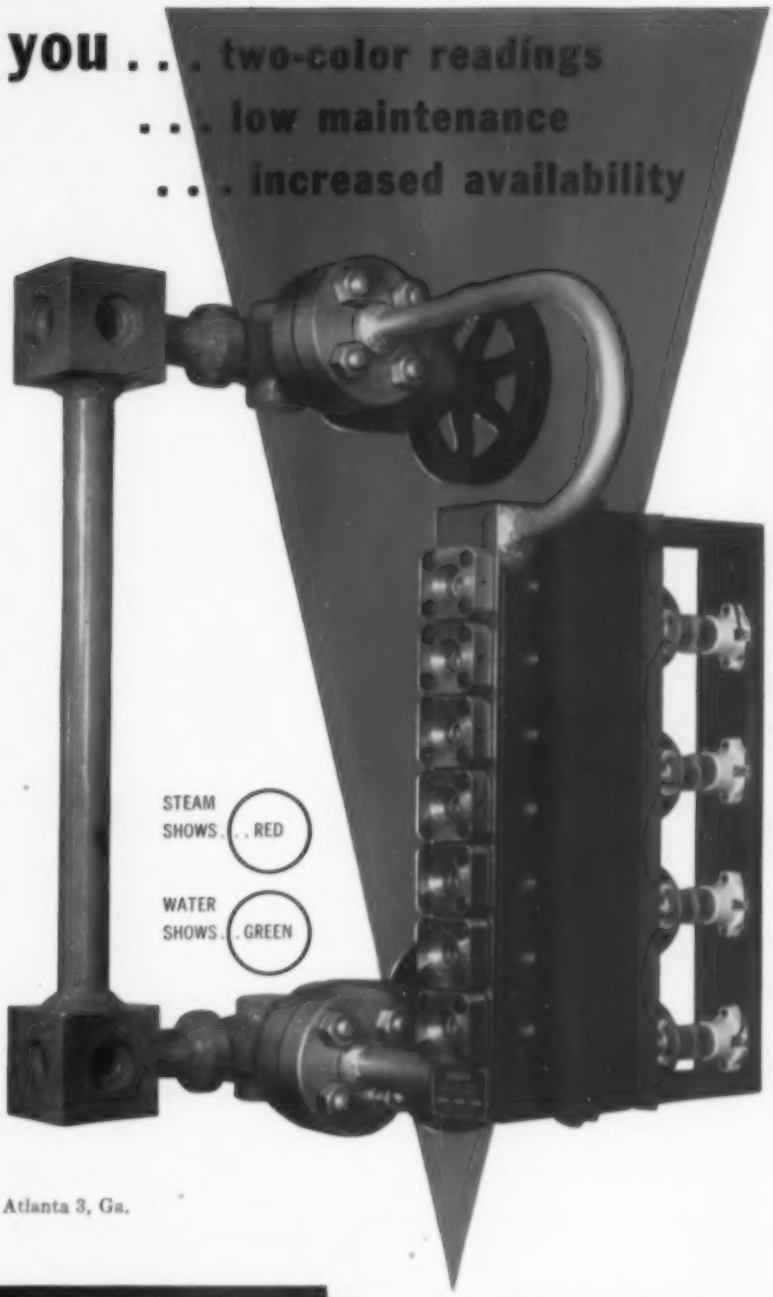
You get a *triple advantage* with the Yarway COLOR-PORT boiler water level gage for pressures to 3000 psi.

Two-color readings are brilliant and clear. Water shows green; steam shows red. A full gage is all green and an empty gage all red.

Low maintenance with individual cover-glass assemblies, each held solidly in place by four socket head cap screws. "Floating assembly" design applies safe, predetermined loads on glass ports, reducing thermal shocks, permitting faster warm-up.

Increased availability means longer service life. Cover glass assemblies can be *serviced in place*, easily and quickly.





Yarway Bulletin WG-1814 describes the Color-Port Gage. Write for it.

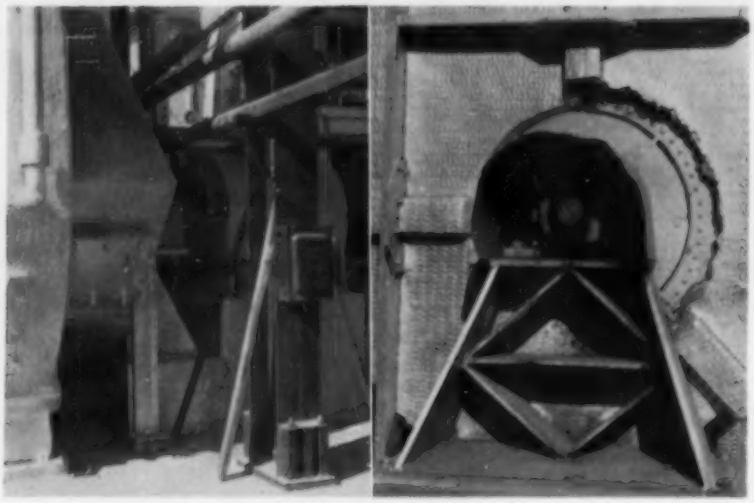
YARNALL-WARING COMPANY
Home Office: 116 Mermaid Ave.
Philadelphia 18, Pa.
Southern Representative:
ROGER A. MARTIN, Bona Allen Bldg., Atlanta 3, Ga.

YARWAY COLOR-PORT . . . *a good way to specify high pressure water gages*

Southwestern Maintenance Crew Saves Money and Time

Metallizing on the Spot

By BOB McALISTER, Roswell Power Plant, Southwestern Public Service Co.



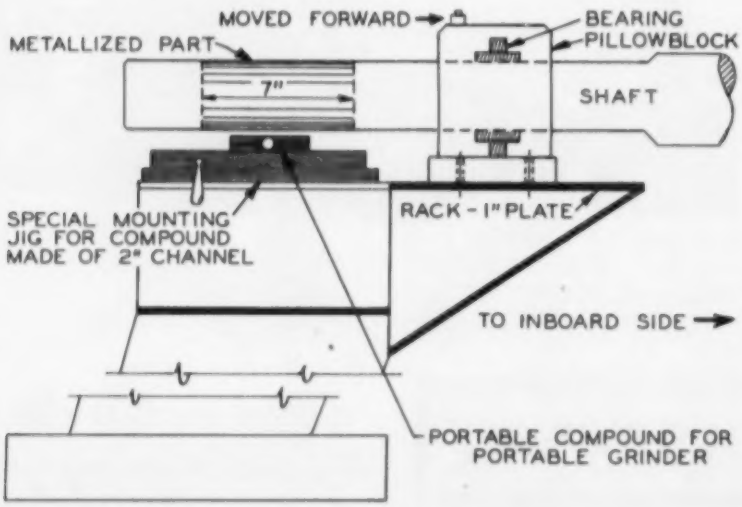
Motor, pulley and switch box were mounted on steel beam at right. Photo at right is end view of pillow block and pedestal, still in good shape after two years operation.

SEVERAL oil changes were observed and sampled for the induced draft fan of our Roswell No. 11 Boiler. It was noticed after the oil had remained in the bearing housing for several days it began to turn a reddish color, indicating electrolysis or wearing. Samples of this oil were sent out, where tests showed iron oxide due to electrolysis, causing pitting and erosion.

It was discovered the trouble was originating between the outboard bearing and the shaft of this fan. It appeared that wear of the shaft had taken place over a period of time.

This outboard bearing had been changed four times in the past five years and it usually started humming and its temperature went to 146 F. The bearing is oil lubricated and the ambient temperature runs around 70 F.

Enlarged shaft bearing surface was needed to give us a slight shrink fit on the bearing. It was decided to wait until the boiler and turbine came down for overhaul to tear down the fan and eliminate the trouble.



Repair Technique

Since we couldn't conveniently dismantle the fan and pull the shaft, it was necessary to do the job of metallizing on the spot, so Albert Thornbro, plant machinist and Bob Maxwell, plant manager began dismantling the bearing assembly setting up the apparatus. Other maintenance men on the job were W. E. Sanders, W. P. Miller and R. O. Redman.

Since it would be necessary to turn the shaft at a low speed for grinding purposes, a motor and belt were rigged up on the inboard side near the motor. On a steel beam a few feet from the fan a small motor was mounted with a pulley and switch box installed on the same beam for power. The large belt was run from the motor to the shaft and the correct rpm was obtained.

On top of the housing pedestal we mounted a steel plate to carry the bearing in a temporary position and support the shaft, while the permanent journal surface was being metallized. The oil was drained and pillow block lifted off with blocks and sledge hammer.

The pedestal bore measured

11.8155". To pull the bearing loose for sliding back required 13 tons from the hydraulic press. After pulling the bearing from lock position the pillow block was removed and slipped on shaft backwards and mounted on the 1" plate toward the inboard side of the shaft.

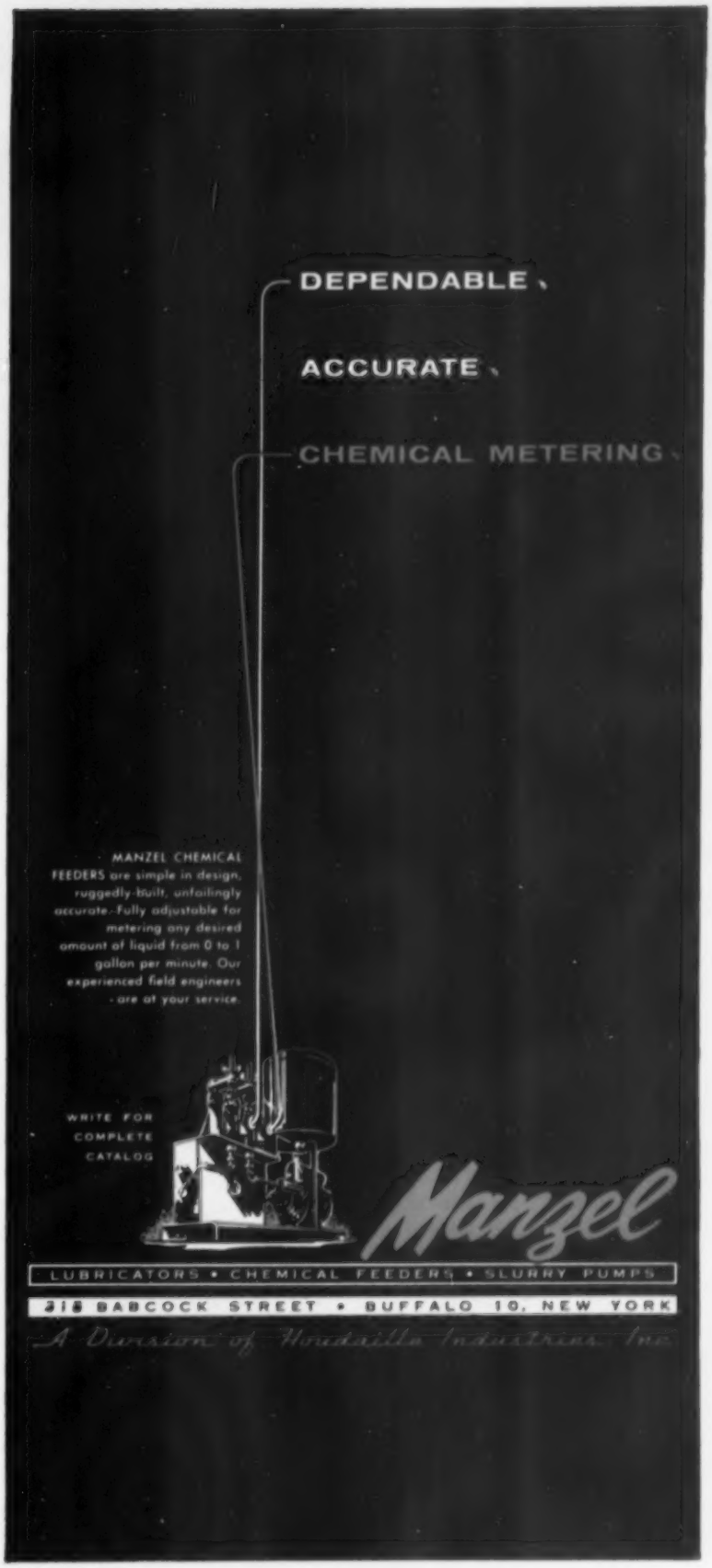
Measurements were taken to determine how much the shaft would have to be built up for a new bearing. The shaft's original size was 4.9365" and measuring top thru bottom at different points it measured 4.941; 4.9425; and 4.9425". The side thru side measurement came out 4.940; 4.9415; and 4.942" indicating wear at different points.

A small precision portable compound with portable grinder attached was set up on the housing pedestal and the compound foundation was made from 2" channel iron for moving grinder forward and back for grinding.

After grinding to necessary dimensions, metallizing of the 7" of shaft was done by Mr. Woodward of our Amarillo, Texas plant. After metallizing was completed, it was again necessary to grind some more with our special rigged compound because of intentional overmetallizing.

The micrometers being used at intervals indicated the compound had done as much as it could without taking off too much. Strips of emery cloth, wrapped twice around the shaft, were able to cut down the metallized part to the exact diameter needed for the new bearing. The micrometers were used again and the measurements came out 4.940, 4.9405 and 4.9405" at 4 points along the length of the journal. Metallizing and grinding completed, old bearing was cut off so as not to mar the shaft in any way. Bore on the new bearing measured 4.938" or .002" smaller than metallized shaft. The bearing was then heated in oil at 300 F and slipped on shaft. Then it was allowed to cool approximately one hour before sliding pillow block into place. This was done by hand with the help of two small bars. The pedestal housing was doweled into place and bolted to base of

(*Continued on Page 67*)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A Division of Houdaille Industries, Inc.

View of dispatching office of Virginia Electric and Power Co. at Richmond, shows system diagram at left, and panel-mounted telemetering recorders in background. Desk control console (computer) is in front of panel, with enlarged view, lower right.

The Brain in Industry

MANY INDUSTRIAL engineers may feel that the term *electronic brain* refers only to devices employed in research organizations, and that such equipment is not likely to become part of their business interest and activity. The reverse is true. Practical information gathering circuits are regularly feeding information into computers and improving industrial performance. Actually such systems are no longer new — and to the initiated they are not spectacular.

A good example of the kind of practical service the brains can render is the system employed by Virginia Electric & Power Company to aid and improve dispatching. This system, engineered by the Leeds & Northrup Company, includes an "electronic brain" which enables the company to realize the greatest possible savings in power generation while operating with interconnected companies.

From a desk console in the Richmond, Virginia dispatching office, the system operator can closely control interchange with two interconnected neighbors. The system automatically distributes load swings among the controlled regulating stations in accordance with previously calculated incremental cost curves.

With 8 steam stations and 14 hydro stations, 13 run-of-stream and 1 peaking hydro, Virginia Electric and Power Company has a system capacity of 1,142,569 kw. Included in the company's service area is government-owned Kerr Dam peaking hydro station with 204,000 kw installed nameplate capacity. The company has two-thirds of this capacity available by the combination of purchase and interchange for delivery to the Southeastern Power Administration customers. It also uses this capacity for regulation under automatic load-frequency control.

The Load-Frequency Control System employed by VEPCO has three basic elements:

(1) Telemeters and recorders which gather essential operating data.

(2) The desk console (or analog computer) which acts as the system brain, in conjuntion with a load-frequency control master controller. This equipment receives information from the recorders and decides what needs to be done.

(3) An impulse generator which sends control signals to the individual turbine-governor motors in order to change generation as required.

One group of the telemetering recorders brings information from six interchange points. A second group records output of the principal generating stations. Another recorder receives all of the meter readings and sums them up algebraically. This gives the dispatcher a figure which represents the

(*Continued on Next Page*)

power flowing into or out of the system.

An Area Requirement recorder receives intelligence from the Net Interchange Recorder, the System Frequency Recorder, the respective schedule setters, and the bias setting, and advises the dispatcher whether generation should be increased or decreased and by how much. This Area Requirement Recorder is a basic operating guide for interconnected system operation and provides continuous and automatic recording which shows exactly how much area generation should be changed in order to match the prevailing area load plus net interchange.

The dispatcher needs only to concern himself with two operations as far as the automatic control is concerned. The first is to make adjustments on the console so that the desired amount of interchange is taking place. The second is to insure that the loading schedules already included in the console provide the needed total generation with the best economy, in addition to providing the necessary response to take care of normal system load changes.

Vertical Turbine Pumps

A REFERENCE book on vertical turbine pumps is available at no charge from Layne & Bowler, Inc., of Memphis, Tenn. The 72-page book discusses methods of selecting deep well centrifugal pumps to attain optimum efficiency; turbine pumps as used for well equipment in small cities; column life of deep well pumps; vertical short-coupled turbine pumps; and efficiency selections in deep well pumps.

In a section entitled "A Corrosion Problem — 3000 Feet Down," actual construction is described of a well which supplies water to Dallas, Texas — a well which reaches down 2886 ft and delivers over 2,225,000 gallons per day.

For your free copy please write Layne & Bowler, Inc., Memphis 8, Tenn.

DOUBLE BOILER BLOW-OFF SAFETY

1

Quick-Operating EVERLASTING Straight-Through Valve

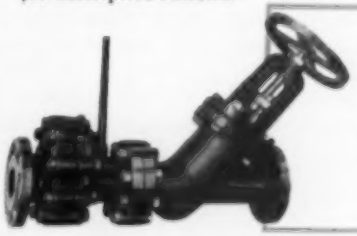
The standard Everlasting design which opens with a quarter-turn of the lever and closes with a drop-tight seal that actually improves with use.

2

Shock-Resisting EVERLASTING Angle Valve

Specially designed and stoutly constructed to withstand severe service and the shocks and abrasion of blow-down solids.

Conform with ASME codes. Available in a range of sizes for pressures up to 600 psig. *Write for descriptive bulletin.*



EVERLASTING DUPLEX UNITS

also available with Y Valves and in any combination of Quick-Operating, Angle and Y Valves.

For "everlasting" service, use

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53 PISK STREET, JERSEY CITY 5, N. J.

Jacksonville, Fla. . . .

Storage Racks

Versatile . . . . . Economical

Finished storage racks in one of Cambar's Jacksonville warehouses.

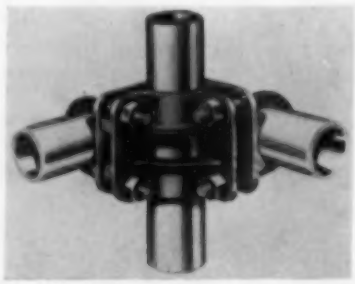
no drilling . . . no welding . . . no threading

INCREASING demands on industrial warehousing jobbers to maintain large inventories has magnified the problem of storage. This is particularly true when it comes to the storage of pipe and tubing items. Before plans for new warehouse construction are considered, however, it is important that every method to fit the large inventories into the present space be examined.

When The Cameron & Barkley Company decided to increase its stock of pipe and tubing a thorough investigation of the various types of storage racks was initiated. The standard method involved construction of pipe racks from cut and bolted angle iron frames. The initial cost of creating this type was high — the bolted storage racks at Cambar's Jacksonville branch for example required 180 man-hours plus the cost of the equipment and materials.

A new approach using a product known as the Tube-Strut Clamp was tried experimentally. In comparison with the bolted racks, the cost of constructing the same size and number of units with Tube-Strut Clamps was very low — requiring about 30 man-hours or one sixth of the time. Additional savings were realized through the use of standard stock pipe of 21 foot lengths.

Furthermore, the materials used in the Tube-Strut Clamp racks are 100% reusable and 100% adjustable, because they require no drilling, welding or threading in their construction. They can be dismantled and reassembled for changing conditions with the simplicity of an erector set.



This Tube - Strut Clamp, used with ordinary pipe or tubing, builds every type of storage rack.

And because men without special skill or experience can erect any storage rack easily and quickly with Tube-Strut Clamps, clean-up men using only pliers, yardsticks, hacksaws and Clamps did the job at Cambar without interfering with the work schedule.

Another big advantage is that one Tube - Strut Clamp makes every connection, allowing the pipe to be joined at right or oblique angles. Close dimensions are never required and the Clamps provide phenomenal gripping strength (laboratory test of 2½ tons on 1" pipe) plus exceptional structural rigidity. This eliminates the need for bracing required in other methods of rack construction studied.

Cambar's enthusiasm over the Tube-Strut Clamp racks was so unanimous that the sales department arranged for the company to become an authorized distributor.

Reported for SPI by GEORGE BLACK, Jacksonville, Florida

Anco water treatment removes rust and scale ...kills slime and algae in your equipment

This time of year refrigeration and air conditioning systems need to be operated longer, with more efficiency than at any other period. Scale and rust, acting as insulators, will reduce heat transfer to minimum. Algae and slime on your condenser tubes, pumps, lines and towers retard water circulation and reduce heat transfer. ANCO Scale Remover, Coolex and Algaecide can correct these conditions.

ANCO Scale Remover, an efficient dry formula, based on DuPont Sulfamic Acid, works while the system is in operation, dissolving heavy scale formation in a few hours.

ANCO Coolex is an inexpensive, effective formula to protect metal surfaces against rust, pitting and scale formation. Maximum equipment operating efficiency with minimum expenditure for upkeep is assured.

ANCO Algaecide removes algae and slime from your cooling water system. This highly effective chemical in convenient briquette form does the job while your equipment is operating.

Competent service representatives covering the south offer you a free survey and analysis of the makeup water going through your system. Write us for full details. No obligation.

SPECIALISTS IN MAKING WATER BEHAVE

Anderson Chemical Company, INC.

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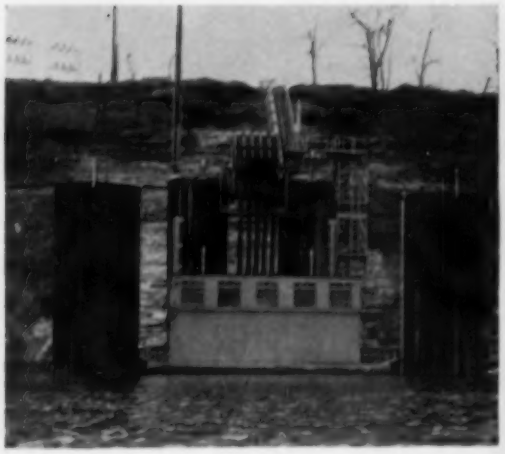
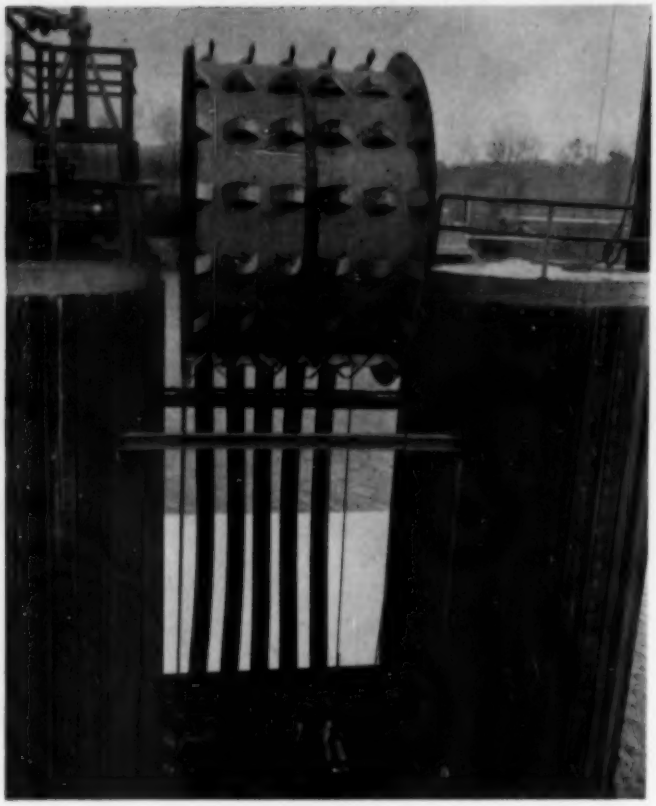


ABOVE — Floating pump house for Ford Motor Company's new glass plant near Nashville, Tenn. was designed to cope with extreme rise and fall of the Cumberland River.



RIGHT — Discharge hose is attached to a 16 ft diameter steel reel. Water flows from hoses through elbows into 24-in. axle of the reel, which serves as manifold for the discharge of all hoses.

Floating Pump House – Nashville

Unusual Discharge Connection

A FLOATING pump house is feeding 14 million gallons of process water a day to the Ford Motor Company's new glass plant near Nashville, Tenn.

Ford engineers preferred a floating pump house to the conventional fixed structure. With the floating pump house, intakes are maintained at a constant immersion depth, regardless of the river level.

Pumps and intake screens are mounted on a welded steel barge, moored to four steel sheet pile cells. The 50 ft by 30 ft barge is fitted with pneumatic-tired wheels at each of its four corners. The wheels run in I-beam tracks welded to the sides of the four cells, which extend 60 ft above the normal water level.

In addition to serving as guides for the vessel's up and down motion, the cells, which are filled with sand and gravel and capped with concrete, help fend off floating logs and debris. The two riverward cells are 16 ft in diameter, the two landward cells are 13 ft 7 in. in diameter.

Mounted atop the landward cells is a 16 ft diameter steel hose reel, grooved to receive five 12-in. diameter rubber hoses. Each hose is attached to an elbow loading into the hollow 24-in. axle of the reel, so that the axle serves as a manifold for the discharge of all the hoses. To one end of the axle is connected a 24-in. diameter pipe which leads along a steel grid walkway to the shore and up the river bank to the water treatment plant. The hoses extend some 40 ft. to discharge outlets on the five pumps.

Controlling rotation of the hose reel are 1⅝-in. diameter steel cables wrapped around the flanges of the reel and leading directly down to the barge on the riverward side and through a fixed sheave between the cells up to the barge on the shore side. Thus, when the river rises, or falls, the cables turn the reel, automatically adjusting the hoses.

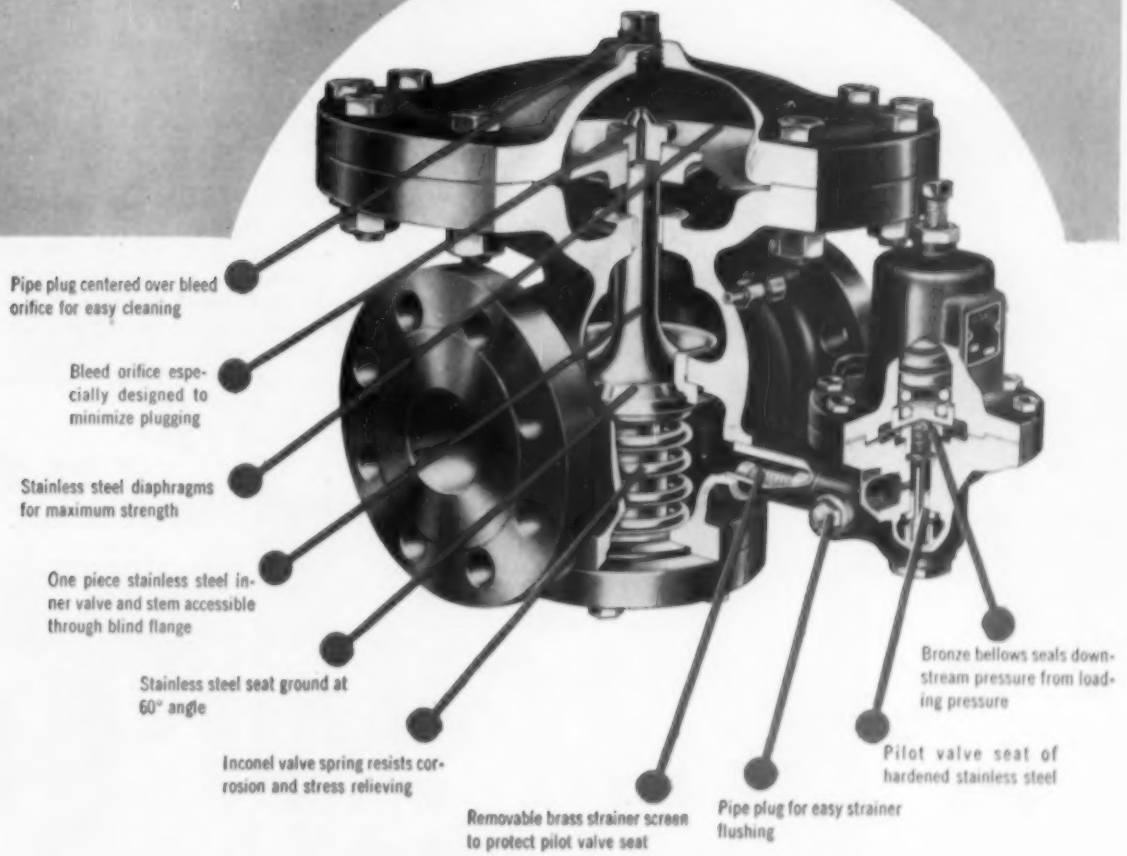
Individual, screened pump suction chambers open 8 ft below water. Pumps are located in a deckhouse on the barge. Four pumps are rated 4000 gpm each and are electrically-driven. The fifth, a 2500 gpm unit, is driven by a diesel engine and is used as a standby in the event of electric power failure.

The four cells were constructed by Dravo Corporation's Contracting Division, and the company's Engineering Works Division built the barge and hose reel.

THE FISHER® 92B

IMPROVED

TO MINIMIZE PROBLEMS INHERENT IN STEAM SERVICE


Pipe plug centered over bleed orifice for easy cleaning
Bleed orifice especially designed to minimize plugging
Stainless steel diaphragms for maximum strength
One piece stainless steel inner valve and stem accessible through blind flange
Stainless steel seat ground at 60° angle
Inconel valve spring resists corrosion and stress relieving
Removable brass strainer screen to protect pilot valve seat
Pipe plug for easy strainer flushing
Pilot valve seat of hardened stainless steel
Bronze bellows seals downstream pressure from loading pressure

Not content with the enviable performance record of the Type 92B, Fisher engineers have improved this pilot operated pressure reducing valve to a new peak of performance.

For extremely accurate, long trouble-free service, put a Fisher 92B in the line. One pilot with three interchangeable springs provides a range of from 2 to 150 psi. • *Send for Bulletin D-92 today.*

Engineers with special problems . . . find the ***answer*** *in . . .*

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FISHER® Controls

New Texas Plant Designed for Process Automation

Hydraulic Valve Controls

A DEVELOPMENT of considerable significance to processing and other industries interested in adopting automation is the employment for the first time of an all-hydraulic system of control to operate product valves in the new multi-million-dollar butadiene processing plant of the Texas Butadiene & Chemical Corp., Houston.

In laying plans for the new, fully automatic plant, its builders were after greater flexibility of control over the flow of butadiene ingredients into reactors, as well as faster operation and lower cost.

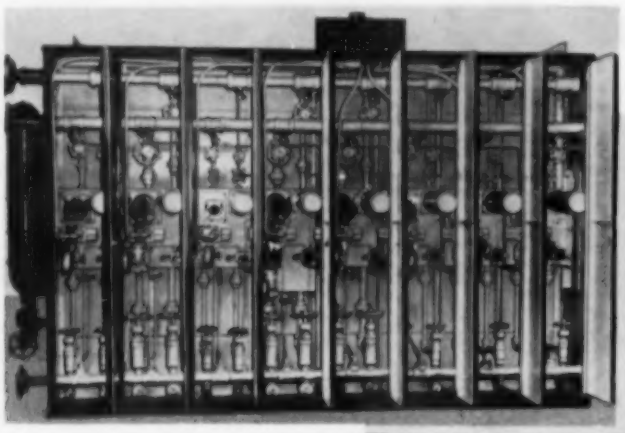
Product gate valves are operated by small, light hydraulic cylinders, which in turn are operated by solenoid valves located at central control panels.

Independently operating control units were designed to control 98 gate valves. Each unit controls the necessary gate valves for seven reactor vessels, each of which has seven gate valves.

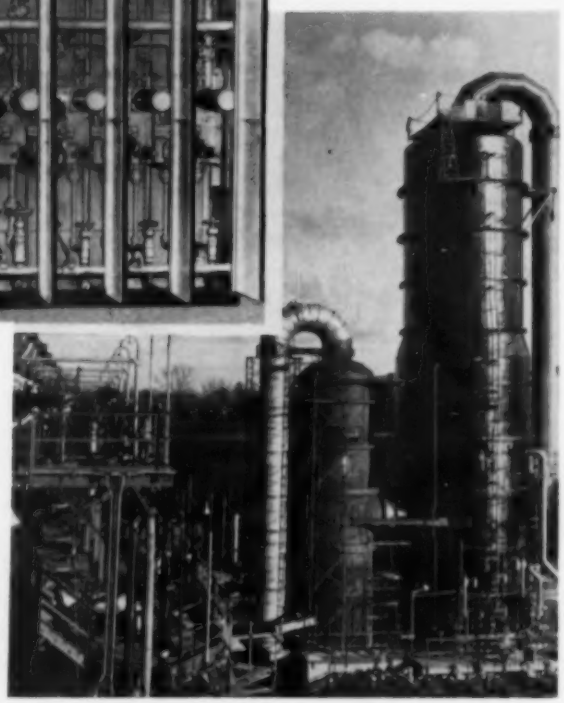
To simplify operation and keep piping and electrical wiring to a minimum, engineers designed common steel mounting panels, with drilled interconnections, for each gate valve circuit. All solenoid valves and filters for operating each gate valve are mounted on these panels.

Power unit for the system includes two electric motor driven positive displacement pumps, with a third stand-by steam turbine driven pump. Control panels are on platform at lower left in photo.

Hydraulic control unit for operating seven gate valves of one butadiene reactor vessel.



View of new Texas Butadiene & Chemical Corp. plant.



ADVANTAGES of the change from electrical to hydraulic control were many. Control wiring and size of installation were reduced to approximately one-tenth. Rate of gate valve travel can easily be varied, and slow starts or stops can be accomplished. The actual operating forces required to open or close valves can be varied.

The entire job, requiring over 500 valves and filters, was designed and built by Rivett, Inc.

Here's why corrosion costs you more than Wrought Iron

One of the most convincing demonstrations of the economy of using *durable* material is a pipe repair job where low-first-cost material has failed—and is being replaced.

The original installation had been quickly made by plumbers. But the replacement calls for hours of work by as many as five crafts: plumber, mason, plasterer, carpenter, painter. Often, maintenance is billed at overtime rates. And this is only part of the cost story. Production slow-down, disrupted routine may amount to far more than the maintenance charges.

Fortunately there's an answer to pipe durability in corrosive services—Byers Wrought Iron pipe. In literally thousands of applications where corrosion is a threat, the use of this material has proved the soundest kind of economy move.

The next time you specify or approve pipe, you'll find it profitable to investigate the durability records of wrought iron.

Our bulletin, "The ABC's of Wrought Iron," gives the what, why and where of this material. Write for a copy.

A. M. Byers Company, Pittsburgh, Pa. Established 1864. Boston, New York, Philadelphia, Washington, Atlanta, Chicago, St. Louis, Houston, San Francisco. Export Division: New York, New York.

Remember—
the pipe that lasts
the longest
costs the least!

FOR PRODUCTION CONTINUITY
LOWER MAINTENANCE—
Insist on Byers
WROUGHT IRON PIPE

BYERS Wrought Iron Tubular and Hot Rolled Products

ALSO ELECTRIC FURNACE QUALITY STEEL PRODUCTS

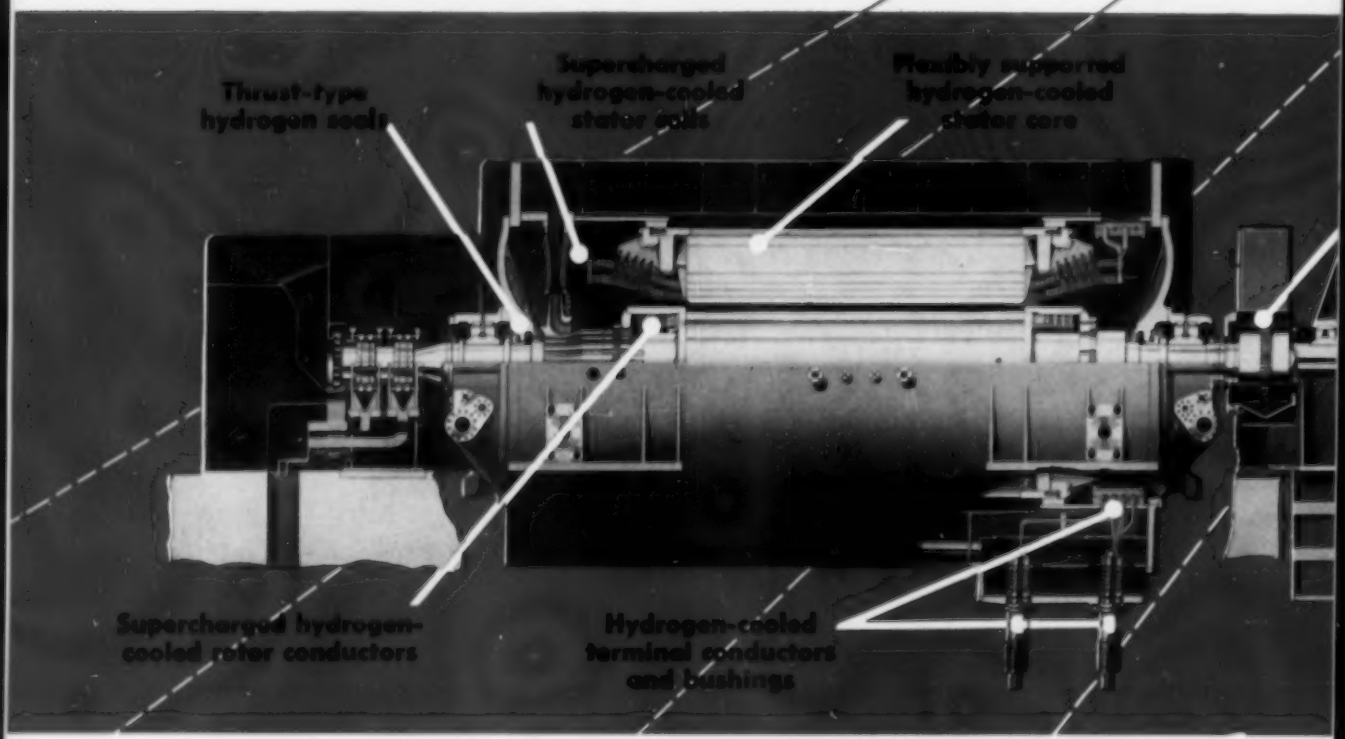
On the

. . . 150-mw double-flow reheat steam turbines with fully supercharged generators for Public Service Company of Indiana

THESE tandem-compound turbines with 26-inch exhaust blades embody such advanced design features as side crossunders that do not have to be removed during inspection; new underslung, side-mounted, two-speed turning gear; solidly bolted-down front control pedestal; and below-floor primary and reheat steam valves.

In the fully supercharged generators, high velocity hydrogen efficiently cools rotor copper, stator coils, core, terminal conductors, and bushings — applying fully the advantages of Allis-Chalmers pioneering in supercharged cooling.

Advances in design of double and triple-flow tandem ratings to 250 mw, and of 3600/3600 rpm and 3600/1800 rpm close-coupled cross-compound arrangements to 500 mw and larger, are discussed in publication 03R8620. Write your nearby A-C office or Allis-Chalmers, Power Equipment Division, Milwaukee 1, Wisconsin.


Thrust-type hydrogen seals
Supercharged hydrogen-cooled stator coils
Flexibly supported hydrogen-cooled stator core
Supercharged hydrogen-cooled rotor conductors
Hydrogen-cooled terminal conductors and bushings

Units for New Albany Station of Public Service Company of Indiana. Turbine steam conditions: 1800 psig, 1000/1000 F, 1.5 in. Hg abs exhaust. Generators: 176,470 kva, 0.85 pf, 18,000 volts, 0.64 SCR at 45 psig hydrogen pressure. Consulting engineers: Sargent and Lundy.

way

ALLIS-CHALMERS

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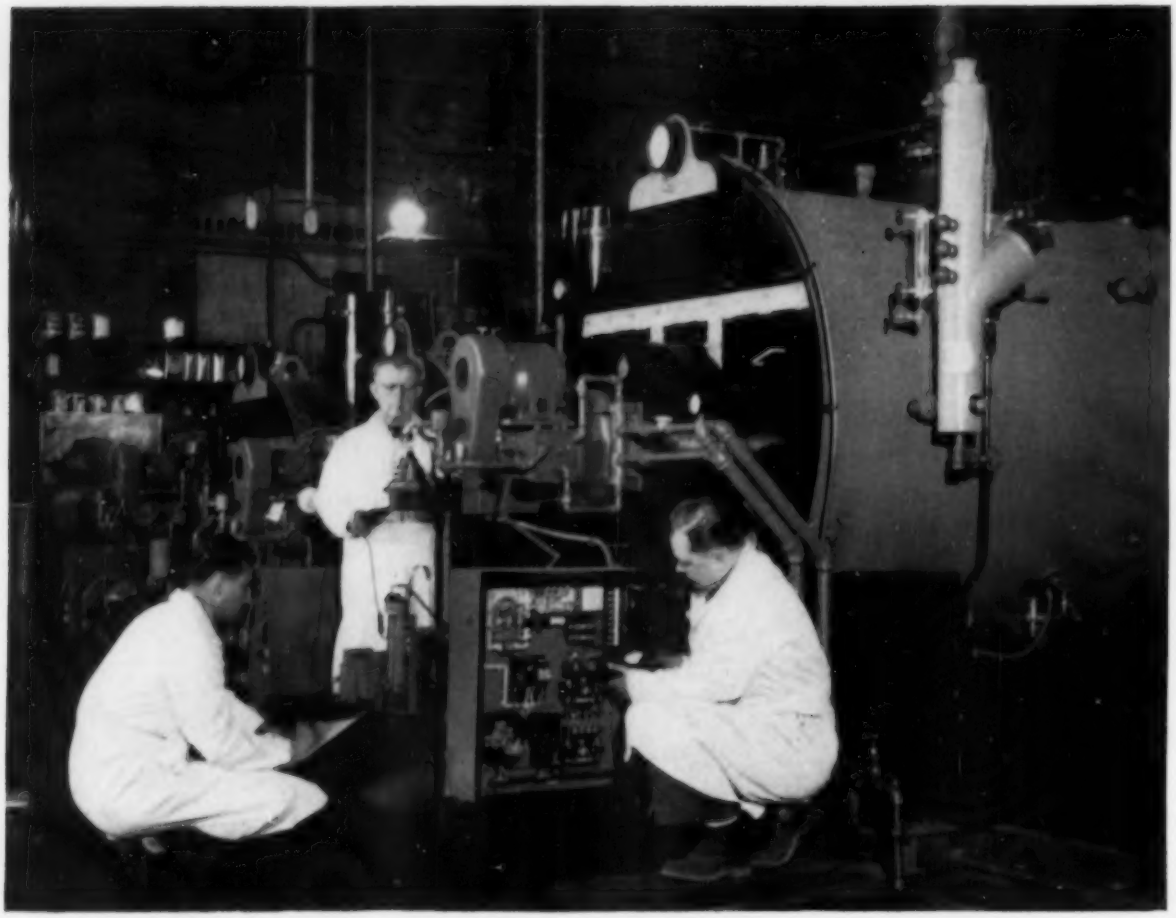

factory fire testing . . .

cuts installation costs for Superior Steam Generators

When specifications call for "all equipment installed and left in first class operating condition", it pays to install Superior Steam Generators. Fully integrated units including boiler, burner and controls, with all interconnecting piping and wiring completed at the factory, Superior Steam Generators are ready to go to work as soon as tied in to steam, water, fuel and electric lines.

And there are no "bugs" in Superior Steam Generators. Completely fire tested at the factory before shipment, and started on the job by a factory trained expert, they are your best assurance of a clean, trouble-free installation. For complete details on sizes from 20 to 600 b.h.p. for pressures to 250 p.s.i. or for hot water, write today for Bulletin 811F.

for performance you can **BANK** *on*

SUPERIOR COMBUSTION INDUSTRIES INC.
TIMES TOWER, TIMES SQUARE, NEW YORK 36, N.Y.

SUPERIOR
STEAM GENERATORS

Vacant Space Below?

OCCASIONALLY, when moving our operations to other of our shops, or when remodeling a building, it happens we're faced with the problem of a buried oil or storage tank. If left buried it will rust out enough to invite a cave-in, yet the tank may be beneath a concrete floor which would be costly to break up and replace after removing the tank.

In such cases we pump a soupy concrete mixture into the tank until the fill pipe is loaded, and that solves the problem.

Editor's Note: Pumping a big tank full of concrete might be expensive. If the tank is fully surrounded by earth, or other material, would dry (or wet) sand prove satisfactory?

By S. CLARK (Florida)

Tampa, Florida . . .

Belting Gets Hard Service

EXCEPTIONALLY hard service is endured by this cross-over conveyor belt made by Thermoid Company for the Florida Stevedoring Company in Tampa. A typical small sulphur-dust explosion has just taken place during unloading of a ship into railroad cars. Resulting fires are small and production is not halted, but patches of burning sulphur on the belt add to severity of service. Approximately 300,000 long tons of sulphur are carried annually.

Ammonia sulphate is also carried on this belt. Moisture, when it comes in contact with the ammonia sulphate, causes the formation of acid which must be resisted by the belt. The acid and fumes also cause rollers to bind and lock. But the freeing of idlers must wait until cargo is unloaded, thus adding to the combination of severe service conditions encountered by the Thermoid belt.

Inventory Records for Pipe Insulation

PLANTS which maintain stocks of thermal insulation for repair and alteration work will find their inventory records much simpler if they use the nominal half-inch thicknesses adopted by all members of The Magnesia Insulation Manufacturers Association for 85% Magnesia, calcium silicate, expanded silica and diatomaceous silica insulations.

In the past, so-called "standard" thicknesses for the various pipe sizes represented an over-simplification and often led to the use of a "standard" thickness in the belief that it was adequate or correct for a given pipe size regardless of operating temperatures. Both the terminology and these actual insulation thicknesses have been abandoned with the adoption of the new simplified thicknesses.

A major advantage of these new thicknesses is that the outside diameter of pipe insulation is approximately the same as the outside diameter of standard iron pipe sizes. Therefore the insulation can be applied either to a pipe or as a second layer over a smaller size of insulation. This reduces the inventory problem by eliminating the necessity of stocking special double layer pipe insulation if the proper sizes for nesting insulation sections are available.

The nominal thicknesses are in half-inch increments which can be used in purchasing or specifying as well as inventory records. A Table of New Simplified Thicknesses published by M.I.M.A. lists insulation for pipe sizes from ⅛ in. through 33 in., nominal half-inch thicknesses from 1 through 5 in., and corresponding actual thicknesses. A similar table is included also in the 85% Magnesia Insulation Manual.

Inventory records will be much simpler when kept in nominal half-inch thicknesses and actual thicknesses should be used only when making critical engineering calculations.

Literature mentioned can be obtained without charge from The Magnesia Insulation Manufacturers Association, 1317 F Street, N.W., Washington 4, D. C.

GILSULATE®

Specially sized, selected and blended Gilsonites

...the natural insulation that is the answer to underground piping problems

To Torture Any Thermal Insulation – Bury It! The severest service test of any thermal insulation is burial underground. High humidity, heavy structural loading, a chemically and organically active environment, thermal cycling and pipe movement, and vibration – all these work to break down the insulation.

Why Buried Piping Corrodes: External corrosion of buried piping is variously caused: *Electrolytic attack* occurs when stray direct currents find their way from a piping system to the earth, at which point pitting occurs on the pipe surface. *Galvanic attack* results from current generated when metal touches certain types of soils. *Chemical attack* may include damage by water in liquid or vapor form, earth salts, chemicals from industrial or organic wastes, or by chemicals in various insulating materials.

Gilsulate solves an old problem by surrounding the piping with a material which is a dielectric, is chemically neutral and stable, is a *natural* insulator and which, in the case of buried hot piping, also forms a good vapor barrier.

No other insulation protects buried hot piping completely! Gilsulate is the only insulation which can provide the three *vital* means of protection, and also withstand the destructive forces of burial in the earth. It is physically and chemically stable. It will not dissolve, crush or rot. It is not rigid; therefore, ground and pipe movement will not destroy its effectiveness.

8 Reasons to use and specify GILSULATE

1. IT IS A NATURAL INSULATION

Gilsulate is mined, crushed, screened and blended from pure Gilsonite mineral, a unique hydrocarbon found only in eastern Utah. No chemical or other physical change is made in the natural mineral. It is a *natural* insulation. Gilsonite is mined in an exceptionally pure state with virtually no trace minerals or foreign materials. Gilsulate is specially sized, selected and blended Gilsonites.

2. IT PROTECTS PERMANENTLY

The Gilsulate system solves the problem of insulating underground hot piping permanently – and at low cost.

3. IT CANNOT DETERIORATE

Chemically inert and stable, Gilsulate cannot change with time, moisture or soil. It is impervious to mold, fungus, bacteria, rodents, plant growth and soil chemicals. It has lain unchanged in the earth for millions of years.

4. IT IS PACKAGED FOR EASY HANDLING

Gilsulate is supplied in 2½ cu. ft. sacks. Shipping, storage and handling at the job site are easy. No bulky, heavy units requiring cranes or special tackle – practical packaging for palletized loading or manhandling to hard-to-reach piping locations.

5. ...AND IT IS ADAPTABLE AT JOB SITE

Gilsulate needs no pre-cutting, mixing, assembling or fitting. Last minute job site changes in the piping layout or arrangements will not demand special fittings or changes in the insulating equipment or methods.

6. EASILY INSTALLED

Gilsulate all but installs itself. Just pour it on... tamp it down... heat the piping... backfill. The Gilsulate fuses to form a plastic protective sheath around the pipe.

7. NO SPECIAL FORMING OR MATERIALS NEEDED

Gilsulate adjusts itself to pipe expansion; provides its own vapor barrier. No hand fitting is needed; no special vapor barriers need be installed. Usually, the trench walls and floor are the only forms needed. Sheet metal or wood slip forms may be used if trench is cut wider than the insulating envelope desired. For a single pipe, or complex multiple piping system, *installation is simple.*

8. PIPING ALWAYS EASILY ACCESSIBLE

Gilsulate structure gives the only underground piping system which can be opened and re-installed with only pick and shovel. Alterations and additions to Gilsulate-insulated systems demand no more skill than does altering a fully exposed piping system.

Do you receive
PIPE INSULATION NEWS?
Ask to be put
on our mailing list.

American Gilsonite Company

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3537 Lee Road, Cleveland 20, Ohio
Affiliate of Barber Oil Corp. and Standard Oil Co. of California

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Ask for a demonstration of GILSULATE's unique properties

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Palmer & Lawrence,
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Carns-Hoaglund Company, 420 N. 15th Avenue, Phoenix

CALIFORNIA
Industrial Insulators, Emeryville & Los Angeles

COLORADO
Joy and Cox, Inc., 2124 Broadway, Denver 2

CONNECTICUT
A. F. Hinrichsen, Inc., P.O. Box 446, Stratford

FLORIDA
George A. Israel, Jr., Jacksonville, Miami & Tampa

GEORGIA
John A. Dodd Co., 299 Techwood Drive, N.W., Atlanta

ILLINOIS
Eagle Industrial Co., Inc., 1021 N. 18th St., E. St. Louis
Roy O. Nelson Company, 330 S. Wells St., Chicago 6

INDIANA
Jackson Engineering Co., Inc., Ft. Wayne, Indianapolis & Terre Haute

IOWA
Allied Industries, Inc., 736 Federal Street, Davenport

KENTUCKY
Jackson Engineering Co., Inc.,
660 S. 5th St., Louisville 2

LOUISIANA
Edgar Murray Supply Co., Inc.,
232 Canal St., New Orleans 6

MARYLAND
Freemire & Associates, Inc.,
2802 Ridgewood Ave., Baltimore 15

MASSACHUSETTS
Beaulieu and Munroe, 82 Crescent Avenue, Boston 25

MICHIGAN
John F. Wolff Company, 726 Lothrop, Detroit 2

MINNESOTA
Paul W. Abbott Co., Inc., 704 Vandalia St., St. Paul 14

MISSOURI
Anderson-Stolz Corp., 1727-33 Walnut St., Kansas City 8

NORTH & SOUTH CAROLINA
Applied Engineering Co., Greensboro, N.C.,
& Orangeburg, S.C.

NORTH DAKOTA
Lignite Combustion Engineering Corp.,
215 Airport Rd., Bismarck

NEW JERSEY
A. F. Hinrichsen, Inc., 9 Ampere Parkway, East Orange

NEW YORK
Ashley Equipment Corp., Albany–Saratoga Rd., Cohoes
H. V. Boggs Co., Inc., 419 E. Jefferson St., Syracuse 2
A. F. Hinrichsen, Inc., 50 Church Street, New York 7
J. B. Magee Assoc., 349 Franklin St., Buffalo 2

OHIO
William G. Jewett Co., 12417 Cedar Rd., Cleveland 6
The Henry P. Thompson Co., Cincinnati & Columbus

OKLAHOMA
Loeffler-Greene Supply Company,
1604 N. W. 5th, Oklahoma City

OREGON
Mead and Associates,
317 S. W. Alder St., Rm. 1100, Portland 4

PENNSYLVANIA
Holly Specialties Co., Inc.,
Walnut & 63rd Streets, Philadelphia 39
J. F. Scouler Company, 2120 Market St., Camp Hill
Tutein Equipment Co., P. O. Box 4453, Pittsburgh 5

TENNESSEE
John M. Dooley & Assoc., 1832 McCalla Ave., Knoxville
Hurston-Conaway, Inc., 2470 Poplar Avenue, Memphis

TEXAS
J. R. Dowdell & Co., Austin, Corpus Christi, Dallas,
Ft. Worth, Houston, Lubbock, San Antonio

UTAH
Williams, Gritton & Wilde, 204 Dooly Bldg., Salt Lake City

VIRGINIA
Shultz and James, Inc., 7 North 6th Street, Richmond

WASHINGTON
Winsor Co., 20031 Marine View Drive S. W., Seattle 66

CANADA
Banton Engineering Specialties,
360 Richmond Road, Ottawa, Ontario
Canwest Industrial Products,
1019–10th Ave. W., Calgary, Alberta
Engineering Equipment Co., Ltd.,
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Insul-Mastic Corporation, Ltd.,
1400 Spruce St., Winnipeg, Manitoba
Perry Products Ltd.,
528 West 6th Avenue, Vancouver 9, B. C.
Michael Stuart Company, Ltd.,
102 Eglinton Ave. E., Toronto, Ontario

Metallizing on the Spot

(*Starts Page 52*)

pedestal. The bearing housing was filled with D.T.E. heavy oil and new packing ring oil seals were installed.

After a few days of service the bearing was running quiet and the temperature had only reached 88 F with the ambient temperature at 70 F. This is the same temperature as the inboard side and at the present time the new bearing is still giving very satisfactory service. With a good tight fit, the metallized shaft should last several years without excessive maintenance.

Welding Charts

TWO-COLOR wall charts, designed for plant training programs in the practical aspects of torch and arc welding are now available at no charge from the Eutectic Welding Alloys Corporation, 40-40 172nd Street, Flushing 58, New York, N. Y.

Each chart, measuring 22 by 34 in., is designed to fit into welding training programs by providing students with graphically clear illustrations of correct arc and torch welding procedures.

The Torch Applications chart (TIS 2690) explains the meaning of low temperature welding, examines the good and bad of common joint designs, and the purposes for which thin flowing and bead forming alloys are designed.

Heating and fluxing procedures, with emphasis on torch distance, angle and motion are also included.

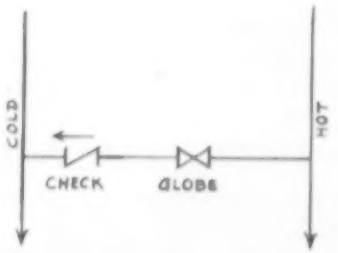
The Metallic Arc Applications chart (TIS 2689) explains the benefits of low heat input, particularly the avoidance of cracking, hardening and embrittlement in the weld zone.

Simple, easy to understand illustrations demonstrate electrode manipulation techniques, pass sequences for "cold welding" cracks, for building up crack sensitive deposits, and for avoiding slag entrapments in fill-ins.

Hot Water — Now!

SERVICE sinks or lavoratories in many plants are located some distance from the water heater. Unless a circulating line was installed when the building was erected, the water in the hot water supply line cools and plant personnel must wait while this cooled water runs down the drain before a hot water supply is available. This wastes both time and water. On the other hand, use of cold water for cleaning operations often wastes soap and cleaning powder.

In most plants, cold water is required with greater regularity than hot; that is, the cold water fixtures (such as water closets) are used more often. In such cases, the hot water supply line can be connected to the cold water supply line through a globe valve and a spring loaded check valve, arranged as shown in the diagram. The spring loaded check valve serves to prevent gravity circulation of hot water into the cold water line and also to prevent back flow.



The globe valve is adjusted so that with average usage, enough water from the hot water supply line flows to the cold water line and thence to the cold water fixtures (water closets, etc.) to keep the water in the hot water supply line at a high temperature. In cold weather, the globe valve may be opened even more, thus "tempering" the cold water and reducing condensation on tank type plumbing fixtures, etc. The "bleed" line from the hot to the cold water lines should be about one-fourth the diameter of the hot water supply line in the average case.

By John A. Weber
Abilene, Texas

Coming in October

10th Annual
BETTER PRODUCTION ISSUE Featuring
Case Studies from South and Southwest

The 1957 **BETTER PRODUCTION ISSUE** of S. P. I. will present specific instances showing how Southern and Southwestern Plants are getting better performance and production because of improvements they have made in:

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CASE STUDIES will show exactly how production has been improved in specific Southern and Southwestern Plants. While emphasis will be placed on increased production, related improvements such as equipment modernization, better maintenance, fewer rejects, reduced operating costs, etc., will be included as part of the overall **BETTER PRODUCTION THEME.**

THE OBJECT of the entire issue will be to present a large number of proven procedures and improvements that may be copied and put to work toward increasing output and improving performance of Southern and Southwestern Plants.

Start your subscription now and be sure of getting the important **BETTER PRODUCTION ISSUE** . . . take advantage of the special rate of three years for $3.00.

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Products manufactured or nature of business _____

News (Continued)

Preformed Metal Products Co. Starts Shreveport Operations

Manufacturing aluminum jacketing for insulated pipe, performed aluminum ell jackets, and a snap-on device for fireproofing I-beam pipe rack stanchions, **Preformed Metal Products Company** is headquartered at 201 Airport Drive, Shreveport, La.

Photo shows **Victor Dunn,** left, vice president and technical director, and **Don Zimmerman,** president. The company's products will be marketed under the name "Premetco."

Mr. Zimmerman formerly operated his own air-conditioning and heating firm in Shreveport. Mr. Dunn, who has spent more than 15 years in the industrial insulation field, was formerly associated with various leading insulation companies. He spent 11 years with Fuller-Austin Insulation Company of Houston.

Iron Fireman—East

Iron Fireman Manufacturing Co. has appointed **Hyter C. Hall, Jr.,** district sales manager of domestic, commercial and industrial heating equipment in the **Philadelphia, Washington** and **Baltimore** areas.

W. Oliver Spencer, Jr., has been appointed industrial sales representative specializing in the sale of Iron Fireman stokers in **North** and **South Carolina, Virginia** and **West Virginia.**

C-V NEWS NOTES

New regulator valve delivers on more jobs

Designed for remote control service, the Copes-Vulcan diaphragm actuated valve handles water, steam, air, gas, oil and other similar fluids with new efficiency. This valve has been engineered and precision-built for those operations requiring superior accuracy and sure dependability.

The Type-CV-D Valve may be direct or reverse acting. It has excellent rangeability and serves a broad variety of applications in sizes up to 12 inch.

Optional features include: cooling fins and stuffing-box lubricator to maintain low friction over longer packing life . . . auto-lock . . . top or side-mounted hand wheel for emergency operation.

To assure trouble-free performance, Copes-Vulcan custom-designs each valve to suit your most exact control requirements. Write for Bulletin 1027.

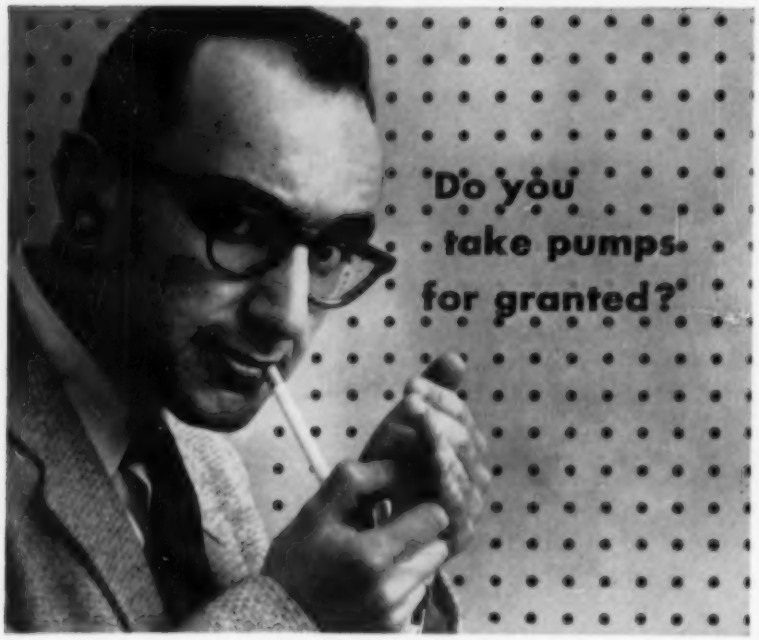
Desuperheater developed to increase control

Based on a new steam-assist principle, this Copes-Vulcan Desuperheater permits close control of final steam temperature for processing work or auxiliaries. Using assisting steam only on lighter loads, it decreases the amount as the load increases. Exclusive swirl-chamber intimately mixes cooling water with steam. In-line type also available. Write for Bulletin 1024.

On-the-job report on boiler control

How Copes-Vulcan helps make more power for Carolina Power and Light Company is covered in this factual report on the Louis V. Sutton plant. Highlights include: Combustion, feed water, boiler feed pump re-circulation controls plus automatic-sequential soot blowing. Write for Bulletin 1032.

COPES-VULCAN DIVISION
BLAW-KNOX COMPANY
ERIE 4, PENNSYLVANIA



Pumps are old stuff to us. But now and then we're still amazed at all the work they do. And we know it's important that they *keep* working.

Take, for example, the 39 Goulds pumps ordered for the new plant being built by the Buckeye Cellulose Corporation. A number-happy chap figures they'll do the work of a bucket brigade of about 3800 men—and cost considerably less.

Those 39 pumps, by the way—they range from a little one-inch model up to five in the 14" size—can move well over 8,000,000 gallons of liquid an hour. Because much of Buckeye's pumpage is corrosive, many of the pumps are of stainless steel.

The gist of all this: Pumps are important in almost any plant—they deserve a lot of careful planning—the kind of planning we've been doing for 109 years.

The kind of planning we can put to work for you whether you pump acids, paper stocks, corrosive alkalies, salt water, slurries, or just plain old water.

GOULDS
PUMPS FOR INDUSTRY

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CHICAGO, 53 West Jackson Blvd.
HOUSTON, 2314 Main St.
NEW YORK CITY, Room 1503, 11 Park Place
PHILADELPHIA, 2099 North 63rd St.
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TULSA, 543 East Apache St., P. O. Box 6157

West Coast Representative: GOULDS PUMPS Western, Inc., 1919 N.W. Thurman St., Portland 9, Oregon
In Canada: The A. R. Williams Machinery Co., Ltd...., in all principal cities

News (Continued)

Atlantic Steel — Birmingham

The Warehouse Division of **Atlantic Steel Company**, Atlanta, has announced the opening of a branch office and warehouse in Birmingham, Alabama. **F. E. Saucier, Jr.** will be branch manager.

Initially, the Birmingham warehouse will stock only Kaiser Aluminum products; however, a full line of steel warehouse items will be added at a later date.

The company has leased property at 4230 First Avenue South, on which construction is now underway on one of the Atlanta firm's own line of Dixisteel Rigid Frame Buildings. Containing 14,000 sq ft of floor area, the building is designed for the installation of an overhead crane as well as for standard warehouse cutting equipment. A modern, air-conditioned office is being provided.

A-C — Memphis

L. D. Craggs has been appointed construction machinery sales manager at the Memphis Branch, Tractor Group, **Allis-Chalmers Manufacturing Co.**, Milwaukee, Wis. He was assistant construction machinery sales manager at Memphis, and before that held the same position at the Dallas Branch.

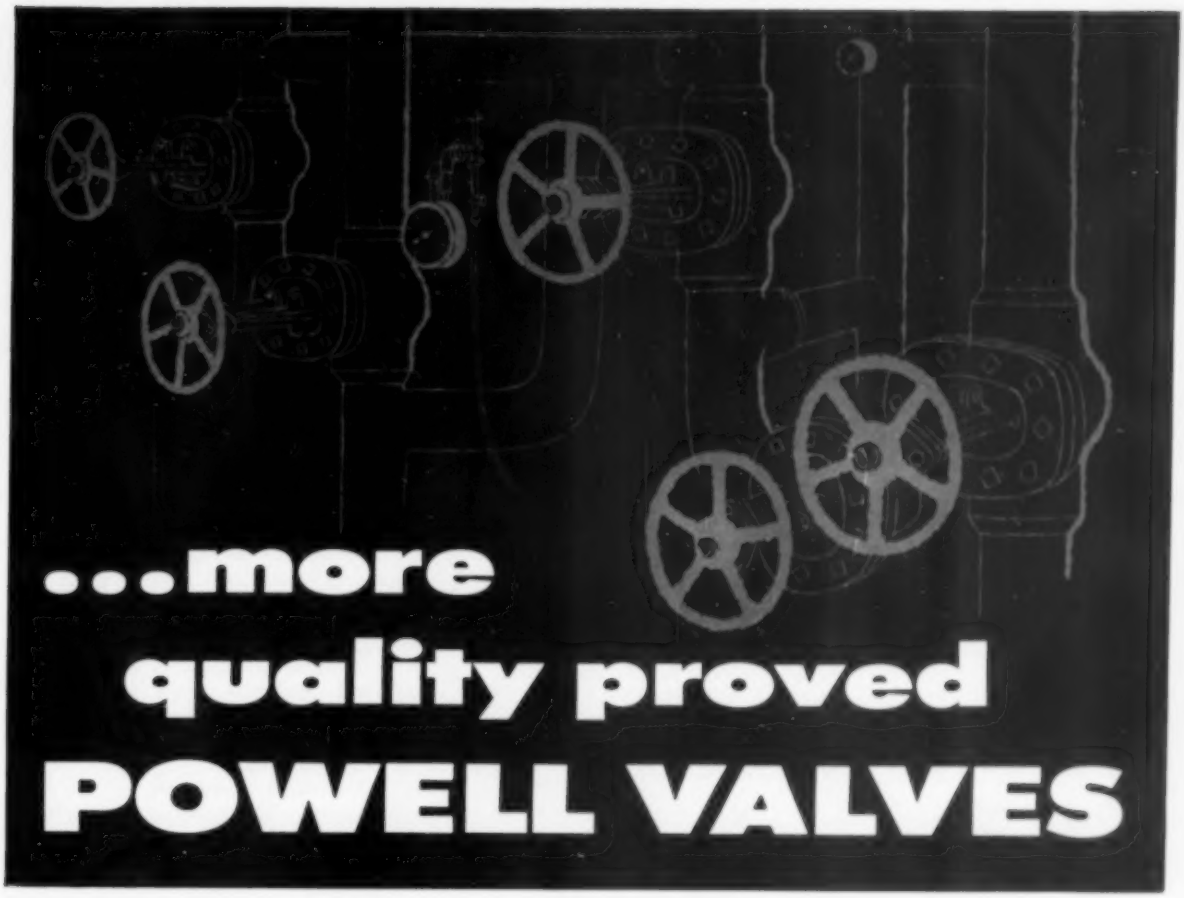
Allen Mfg. — South

Appointment of **John R. Hancock** as Field Sales Representative in several southern states has been announced by Willis D. Horner, vice president — Sales, of **The Allen Manufacturing Company**, Hartford, Connecticut.

Hancock will represent the socket screw manufacturing firm in Georgia, Florida, Alabama, Mississippi, and in Chattanooga and Nashville, Tennessee, and Baton Rouge and New Orleans, Louisiana.

Hancock was formerly in the purchasing department of Lockheed Aircraft Corporation, at Marietta, Georgia, and more recently has been sales representative for industrial products and equipment in the southern area.

He will make his headquarters at 360 Hascall Road, N. W., Atlanta.



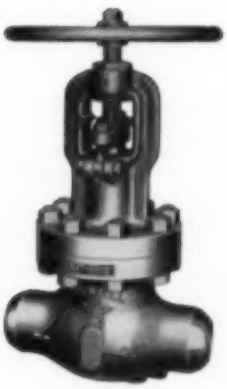


Fig. 6031S-WE—600-Pound Steel Globe Valve for Steam Service. Outside Screw Stem and Yoke.

Fig. 19003—Powell Steel Pressure Seal Gate Valve for 900 Pounds W.S.P.

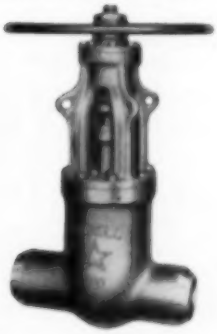


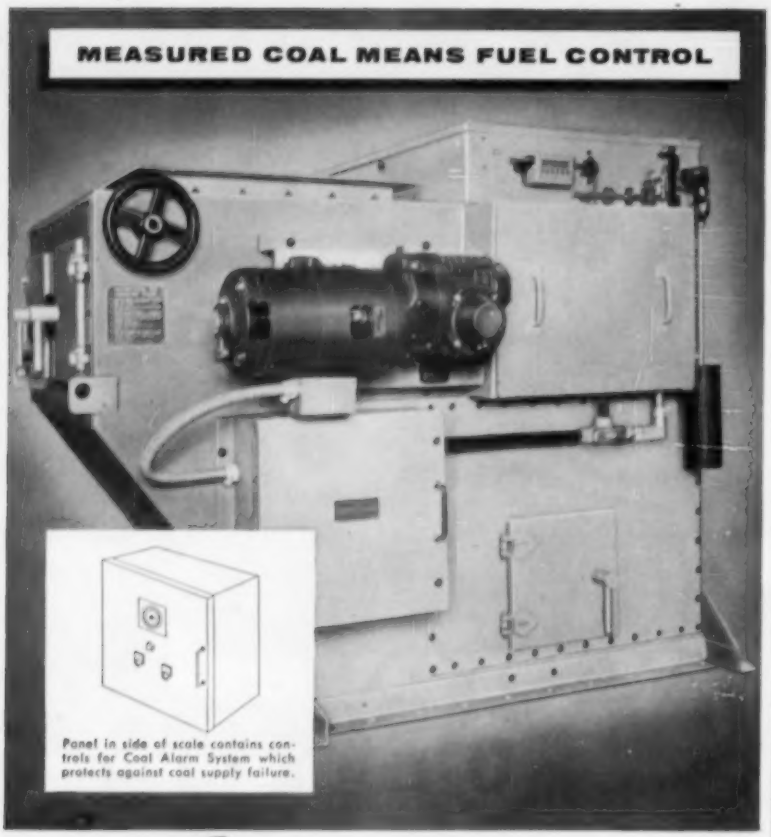
Fig. 2467—Small 300-Pound Stainless Steel O.S.& Y. Gate Valve. For handling boiler feed water treating solutions.

Fig. 1793—Iron Body Bronze Mounted O.S.& Y. Gate Valve for 125 Pounds W.S.P.

made with quality proved materials

Consult your Powell Valve Distributor for full facts about quality proved bronze, iron, steel, and corrosion-resistant valves. For every flow control problem—there is a Powell Valve to solve it . . . *better*.

THE WM. POWELL COMPANY, CINCINNATI 22, OHIO . . . 111th YEAR


MEASURED COAL MEANS FUEL CONTROL
Panel in side of scale contains controls for Coal Alarm System which protects against coal supply failure.

Richardson H-39

AUTOMATIC COAL SCALE

saves you money through dependable, efficient, safe operation

Latest in the series of Richardson Automatic Coal Scales, the H-39 is available in two sizes: a 200-pound model with an hourly capacity of up to 20 tons and a 500-pound model with an hourly capacity of up to 40 tons. Here are some of the reasons why it is specified throughout the world by industries that demand outstanding quality and superior operation.

- Large 24" x 24" inlet (standard for all models) so coal moves through freely. Coal never "arches" in an H-39 feeder or weighing hopper.
- All contact platework of stainless steel.
- All parts of scale positively dust-sealed.
- All electrical equipment totally enclosed and installed outside of dust-proof housing, so it is never in contact with coal dust at any time.
- Endless belts available.
- Feeder removable.

For further information, write for bulletin 0352-A.

Richardson

MATERIALS HANDLING BY WEIGHT SINCE 1902

RICHARDSON SCALE COMPANY, CLIFTON, NEW JERSEY

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New York • Omaha • Philadelphia • Pittsburgh • San Francisco • Wichita • Montreal
Toronto • Havana • Mexico City • San Juan • Geneva, Switzerland • Nottingham, England

News (Continued)

Atlas Laboratories — Houston

The name of Atlas Exploration Co., Houston, Texas, has been changed to **Atlas Laboratories, Incorporated,** to reflect more accurately the nature of the company's activities.

At the same time, it was emphasized that all officers will remain the same and that the company will continue to produce and market its advanced line of gravity meters and gas detectors.

Wickwire Rope — La.

Southern Equipment & Tractor Company of Monroe and Shreveport, Louisiana, has been appointed a distributor of Wickwire rope in northern Louisiana, it was announced by the **Wickwire Spencer Steel Division of The Colorado Fuel and Iron Corporation.**

John B. Woodburn, vice president, heads Southern Equipment's Monroe branch and **Tommy L. Downs** is manager of the Shreveport office, the modern sales and service office opened in 1955.

C P & L — Raleigh

M. T. Dunlap has been named industrial relations consultant of **Carolina Power & Light Company.** He is succeeded as personnel director by **J. S. Newbold,** former assistant.

Announcement of the promotions was made by H. B. Robinson, CP&L vice president and general manager, who pointed out that Mr. Dunlap will be the company's representative in planning and outlining personnel development programs. He has been with the company since 1922, and has served as personnel director for the past 16 years.

Newbold has been with the company 11 years, employed first as test foreman at the Cape Fear steam electric generating plant near Moncure. He was later named superintendent of the company's steam plant at Lumberton, and for the past two years has been under Mr. Dunlap's supervision in the personnel department. He is a graduate of N. C. State College with a degree in mechanical engineering.

BRING YOUR COAL UTILIZATION PROBLEMS INTO FOCUS

FUEL SATISFACTION

Whatever Your Coal Needs May Be, You Can Always Depend On Fuel Satisfaction*

With so many kinds of coal on the market, even a fuel specialist might wind up with multiple vision when trying to decide which coal is best for a particular job. But when his studies are complete, chances are his attention will focus on Fuel Satisfaction.

This fine coal is versatile — equally suited for heat, power or by-product processing. Those who have used it will tell you that it is cleaner and purer than other coals, contains greater heat values and produces more efficiency.

Fuel Satisfaction has proved its superiority on job after job to generations of industrial coal users. This can mean increased economy and all-around efficiency for your coal-using operation. Why not investigate Fuel Satisfaction soon through one of the Norfolk and Western Coal Bureaus listed here?

* Fuel Satisfaction is the name given all brands of superior all-purpose Bituminous Coal mined along the N&W.

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N&W Coal Traffic Dept.
Telephone Diamond 4-1451, Ext. 313, 423, 249, 732
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Room 604, 208 South LaSalle Street
Telephone RAndolph 6-4634
Chicago 4, Illinois

CINCINNATI
913 Dixie Terminal Building
Telephone DUnbar 1-1325
Cincinnati 2, Ohio

CLEVELAND
1819 Union Commerce Building
Telephone MAin 1-7960
Cleveland 14, Ohio

DETROIT
1907 Book Building
Telephone WOodward 1-2340 or 1-2341
Detroit 26, Michigan

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CARRIER OF FUEL SATISFACTION

pd offers 5 basic boiler components

P-D makes it easier, safer and quicker when you sign that order for steam generating auxiliary equipment. There's no time delay; no engineering problems; no piece-by-piece delivery from different sources.

Prat-Daniel's *single responsibility* guarantees equipment of balanced design . . . matched for ease of assembly, unmatched for peak performance. Each component is built to complement the other, with the integrated unit providing highest efficiency for your system.

Prat-Daniel offers years of specialized experience in the design and development of *Forced Draft Fans, Air Preheaters, Tubular Dust Collectors, Induced Draft Fans* and *Fan Stacks* for industry.

Contact The Thermix Corporation, Project Engineers for Prat-Daniel, for your requirements. Ask for data sheets on P-D equipment.

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(Offices in 38 Principal Cities)
Canadian Affiliates: T. C. CHOWN, LTD., Montreal 25, Que.

Designers and Manufacturers
PRAT-DANIEL CORPORATION
SOUTH NORWALK, CONN.

POWER DIVISION: Tubular Dust Collectors, Forced Draft Fans, Air Preheaters, Induced Draft Fans, Fan Stacks

News (Continued)

Lewis-Shepard — Miami

The appointment of **Clement N. Williams** as its exclusive sales and service representative in the Miami, Fla., area has been announced by **Lewis-Shepard Products, Inc.,** producer of electric fork trucks and related materials handling equipment.

Mr. Williams will maintain complete sales and service facilities at 6821 Sunset Drive, So., Miami, Fla., and represent Lewis-Shepard in such cities as Fort Meyers, Sarasota and Palm Beach, besides Miami.

He has been associated with the materials handling industry for the past 11 years. Previous to his appointment, he was Assistant Sales Manager for Lewis-Shepard, and prior to that was New England Sales Manager for Clark Equipment Co.

Allis-Chalmers Appointments

W. E. Korsan, formerly manager of the **St. Louis** district, is now manager of sales of the company's electrical application department.

J. C. Lovelace, formerly of the **Amarillo, Texas,** office, has been named manager of the St. Louis district succeeding Korsan.

Newly named sales representatives to Allis-Chalmers Industries Group offices in the South are **James C. Breth** at **Chattanooga,** and **James F. Cooke** at **Richmond.**

Union Carbide Plans Another W. Va. Plant

Union Carbide Corporation will soon start construction of a major chemicals production plant in **Putnam County, West Virginia.** When completed in 1960, plant will employ about 500 people.

Facility will be operated by **Union Carbide Chemicals Company,** Division of Union Carbide Corporation. Company already has two major plants for the production of organic chemicals in this region. The new plant will produce chemicals for the market and supply raw materials for further processing at the South Charleston and Institute plants. Three of the most important chemicals to be made are ethanol, ethylele oxide and isopropanol.

What good is specialized business publication advertising?

Frank Kistenberger
Metallizing Engineering Co., Inc.

Sells industry

No one is in a better position to give a hard-boiled, practical answer to this question than the men who spend their working lives on the sales front . . . the men the ads are supposed to help . . . the men who sell.

Here is the statement of a salesman who knows what advertising does for him when it appears in the industrial, trade or professional publications that serve the specialized market to which he sells:

Says Mr. Kistenberger:

"I happen to know that better than 50% of my sales to new companies can be traced to leads from our business paper advertising. Another 25% of my sales to new owners I close after following up leads that can't be traced directly to our advertising, but I know darn well that that's where they come from because that's about the only place they could learn about our metallizing systems.

"It's been my experience that our trade advertising is getting to the right people. In many cases this man is an executive who is hard to see on a cold call. But he's a guy that will take the time and trouble to read and he's just the one to drum up interest in metallizing down the line in his company. In other words, you get more action if the suggestion comes down to the production department or the plant engineer from this executive. Of course, I don't mean to say that people will just read about a product like ours and instruct someone to write out an order. It's not that simple. But they do know about metallizing from our advertising and sometimes a surprising amount. That was particularly true of our new ceramic spraying equipment which was introduced last year and which got us into fields we'd never been in before. I think that getting a new product known is usually a pretty tough job but the leads our advertising got us were a big help in reaching the right people."

Why not ask your own salesmen what your company's business publication advertising does for them. If their answers are generally favorable you can be sure that your business publication advertising is really helping them sell. If too many answers are negative it could well pay you to review your advertising objectives – and to make sure the publications that carry your advertising are read by the men who must be sold.

The Manufacturer

NBP

One of the 207 members of National Business Publications, Inc. ...each of which serves a specialized market in a specific industry, trade or profession.

For more information, use Reply Card—Page 81

HOW YOU SAVE,

Getting Drier Compressed Air

● Direct saving in the cost of cooling water saves the price of the Niagara Aero After Cooler (for compressed air or gas) in less than two years.

Extra, for no cost, the drier air gives you a better operation and lower costs in the use of all air-operated tools and machines, paint spraying, sand blasting or moisture-free air cleaning. Water saving also means less expense for piping, pumping, water treatment and water disposal, or you get the use of water elsewhere in your plant where it may be badly needed.

Niagara Aero After Cooler assures all these benefits because it cools compressed air or gas below the temperature of the surrounding atmosphere; there can be no further condensation in your air lines. It condenses the moisture by passing the air thru a coil on the surface of which water is evaporated, transferring the heat to the atmosphere. It is installed outdoors, protected from freezing in winter by the Niagara Balanced Wet Bulb Control.

Write for complete information; ask for Bulletin No. 130

NIAGARA BLOWER COMPANY

Dept. SP-8, 405 Lexington Ave. New York 17, N. Y.

Niagara District Engineers in Principal Cities of U. S. and Canada

INDUSTRIAL COOLING HEATING • DRYING

NIAGARA

HUMIDIFYING • AIR ENGINEERING EQUIPMENT

NEWS BRIEFS

About Your

Equipment Manufacturers

At a recent meeting of the Board of Directors of **Infilco Inc.**, **P. N. Engel** was elected Chairman of the Board and **J. S. Gustafson** was elected President.

Midcontinent Tube Service, Inc. of Evanston, Illinois has appointed **Harold Michel** and **Cyril M. Rappaport** to its executive staff.

William B. Denniston has been named sales manager of **Panellit, Inc.** of Skokie, Illinois.

Milton Roy Co., manufacturing engineers of controlled volume pumps and chemical feed systems, has announced the appointment of **John Procopi** as Sales Manager.

R. F. Stewart, Sales Manager for the Precipitator Div. of **Western Precipitation Corp.**, has announced the assignment of **Walter L. Penick** as Industry Engineer for serving customers in the Mining and Metallurgical industries. Mr. Penick joins **R. G. Gaw** and **R. J. Plass** who were earlier appointed Industry Engineers for the Steel and Cement industries, respectively.

Bailey Meter Co. of Cleveland, Ohio, has announced the election of **C. E. Sutherland** as vice president in charge of manufacturing, **E. O. Stern** as treasurer and assistant secretary, and Vice President **H. H. Gorrie** as a member of the Board of Directors.

Climax Engine & Pump Mfg. Co., a division of Eversharp, Inc., has changed its name to **Climax Engine Manufacturing Co.** Its District Office at Dallas, Texas, has been moved from Continental Ave. to the Tower Petroleum Building, 1907 Elm St., Dallas 1.

Samuel R. Parry has been elected vice president of **Combustion Engineering, Inc.**

R. F. Stewart, Sales Manager of **Western Precipitation Corporation's** Precipitator Sales Division, has been elected a Vice President of the Corporation.

Edward J. Healy was recently elected Vice-President-Construction, of **The Kuljian Corporation**, Philadelphia engineers and constructors.

William R. Kennedy is now Assistant Sales Manager of the **Hammel-Dahl Co.**, manufacturers of automatic control equipment.

Devcon—East

Devcon Corporation of Danvers, Massachusetts, manufacturers of plastic steel, used in industry to repair machinery, make tools, jigs and molds, has appointed **Tidewater Supply Company, Incorporated,** Norfolk, Virginia, with branch offices in **Richmond** and **Roanoke,** Virginia, industrial suppliers of Devcon products.

Also appointed as a Devcon distributor was **Harry P. Leu, Incorporated, Orlando,** Florida, and their branch office in **Miami,** Florida.

Les Tye Company Has New Dallas Office

Les Tye Company, manufacturers' representative with headquarters in Forth Worth, Texas, has announced the association of **Wallace R. Hopkins** as manager of the company's new Dallas office serving the Dallas-East Texas area.

The company represents Modine Mfg. Co., Davis Engineering Corp., Vulcan Radiator Co., Illinois Engineering Co., McDonnell & Miller, Inc., Thermal Engineering Corp., Sellers Engineering Co., Pacific Pumping Co., and The Marley Co.

Niagara Machine — Ga. & Tenn.

The Noland Company, Inc. has been appointed distributor for **Niagara Machine & Tool Works in** Georgia and Tennessee.

The Noland Company is an established distributor of machine tools, well qualified to serve the sheet and plate metalworking industries in this area.

Headquarters of the Noland Company are at 301 West Eighth Street, Chattanooga, Tennessee. Telephone: 5-3101. Branch offices are located in Atlanta, Augusta, Decatur and Marietta, Georgia, as well as Johnson City, Memphis and Nashville, Tennessee. The company will distribute the entire line of Niagara presses, press brakes, shears and related machines and tools.

SUBOX PAINTS
ACTIVELY WORK
TO PROTECT

Only Subox paints are made with lead-suboxide. This colloidal pigment achieves maximum surface penetration . . . packs to form a dense, impervious coating. Moreover, it is *chemically active* . . . actually works continuously to combat corrosion.

Too, Subox paints deflect external heat and radiate internal heat, thereby keeping metal surfaces cooler. This quality is particularly important in the protection of such property as transformers, power plant and sub-station equipment.

Subox paints assure protection and economy in a way that no other paint can give. They are easily applied by brush, spray or flow-coating and endure for many years: they do not crack, chip or blister, even under the most severe conditions. Available in attractive modern colors.

Write for booklet: "Subox Paints".

SUBOX PAINTS

Subox Inc.

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Hackensack, N. J.

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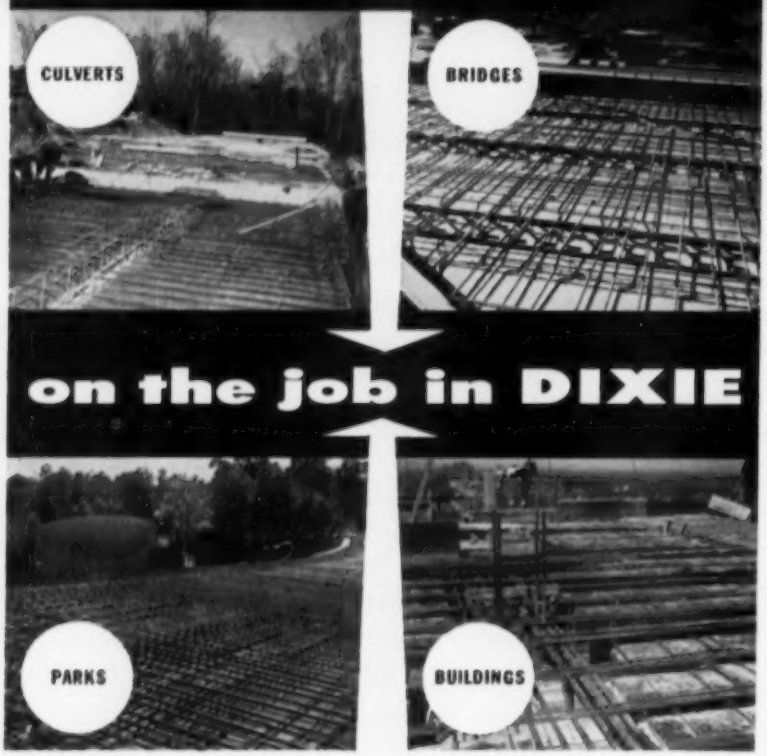
TRADE MARK

reinforcing bars



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No matter how big or little the job may be, you can depend on DIXISTEEL Concrete Reinforcing Bars to be fabricated to exact specifications, and delivered on schedule.

DIXISTEEL Reinforcing Bars are hot-rolled from our own high-quality steel and fabricated at the mill by men who take pride in turning out quality products.

On your next job, call us in and see why the entire construction trade has found it pays to do business with DIXISTEEL.

- Quick, accurate estimates
- Competent engineering aid—detailing and bills of material
- Rapid, dependable service
- Complete, adequate stocks

- WELDED WIRE MESH
- BAR SUPPORTS
- FIBRE TUBES FOR COLUMNS

FABRICATING DIVISION

Atlantic Steel Company

P. O. Box 1714, ATLANTA 1, GEORGIA—TRinity 5-3441

News (Continued)

Robertshaw-Fulton—Baltimore

Appointment of **James D. Crum** as sales engineer assigned to the Baltimore office of Fulton Sylphon Division, **Robertshaw - Fulton Controls Company,** has been announced by George L. Ogdin, Jr., general sales manager.

Formerly Mr. Crum was applications engineer in the division's headquarters, Knoxville, Tennessee. He joined the organization in 1951 after attending the University of Tennessee.

Food Machinery—W. Va.

The Fluor Corporation, Ltd., Los Angeles engineering - construction firm, has been awarded a contract to modernize and expand **Food Machinery and Chemical Corporation's** carbon tetrachloride plant at **South Charleston, W. Va.**

This new project is another step in a program of expansion and rehabilitation of the whole South Charleston plant of Food Machinery's Westvaco Chlor-Alkali Division.

When completed early in 1958, the capacity of this major chemical production facility will be approximately doubled.

Yale & Towne—Florida

Hunt Truck Sales and Service Co., with offices and shop facilities in Tampa and Miami, have been named exclusive franchise representative for Yale industrial lift trucks in central and southern **Florida.**

Hunt offices are located at 211 S. Tampa Street in Tampa, and 2155 N. W. 26th St. in Miami.

The materials handling activities of the company will be headed by **Thomas Hartland.**

Amer. Pulverizer — Southeast

The American Pulverizer Company of St. Louis, Missouri, manufacturers of coal crushers and other reduction equipment has announced the appointment of **J. B. Frescoln,** 716 Walton Bldg., Atlanta, Georgia, as their Southeastern Sales Representative covering Georgia, Alabama, and Florida.

Universal Rack Opens Tennessee Plant

The new plant of the **Universal Rack Company, Inc.,** at Lebanon, Tennessee, will manufacture all types of engineered racks and fixtures for the plating, organic finishing and material handling industries.

Duke Scott will be General Manager of the plant and **Harry Tenpenny,** Sales Engineer. Mr. Scott spent the past four years with General Electric's Appliance Park in Louisville as Plating Process Planner.

Milton Roy — Florida

G. L. Wilson is now General Manager of **Milton Roy Company's** new Petersburg, Florida, manufacturing plant at 6301 49th St. N. Plant will house manufacturing facilities for instruments, pump parts, relief valves and instrument research and development.

Mr. Wilson was formerly assistant to Milton Roy's President, Robert T. Sheen.

George Schneider will be Manager of Research and Development of the Analytical Instrument Division.

Wiretex — Southeast

Wiretex Manufacturing Co., Inc., Bridgeport, Conn., manufacturers of a complete line of wire mesh products for industry, has appointed the **F. H. Ross & Co.,** Charlotte, North Carolina, as distributors in the Southeast.

F. H. Ross Co. has been serving eleven southeastern states for over a quarter of a century. The company has thirteen office-warehouses, with approximately 225,000 sq ft of floor space in eight southeastern states.

Pittsburgh Corning — Fla.

Paul D. Japp, vice president of the **Pittsburgh Corning Corporation,** has announced the appointment of **William O. Morin** as sales representative in Florida and the southern portion of Georgia, with headquarters at 245 N.W. 123rd St., Miami, Florida.

He will assist distributors of Foamglas Building, Industrial and Low Temperature Insulation and act as advisor to engineers and contractors concerning the application of this product.

GOT A PUMPING PROBLEM?

PERHAPS THE ANSWER YOU'RE LOOKING FOR IS A ROPER ROTARY PUMP

ROPER PUMP-MOTORS

These units offer low-speed and high-torque, and their versatility finds them well-suited to heavy-duty service within their operating range. In general, recommended speed is 200 to 800 R.P.M. with pressures to 800 P.S.I. In this range, they require from 7 to 40 G.P.M. flow and will develop up to 11.5 H.P. output at maximum speed and pressure.

ROPER SERIES F PUMPS

Among the dependable Ropers is the Series F Pump — pressures to 500 P.S.I., sizes 1 to 300 G.P.M. It features four-port design with 8 optional piping arrangements . . . supplied in standard fitted models. With packed box or mechanical seal; with or without relief valve.

ROPER SERIES K PUMPS

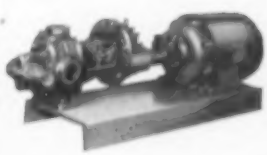
Operate your hydraulic circuit with the correct size Roper for the particular job. In many cases the Series K will do, for it is rated from pressures to 150 P.S.I., capacities ¾ to 50 G.P.M. This model is compact, sturdy . . . is self-lubricated by liquid pumped. Comes with packed box or mechanical seal . . . with or without relief valve.

ROPER SERIES H PUMPS

Lower maintenance costs with a Roper. For instance, a pump like the Series H with pressures to 1000 P.S.I., sizes 10 to 75 G.P.M. is ideally suited for hydraulic mechanisms and for other applications requiring high pressures. Spur gears run in axial hydraulic balance . . . roller bearings and bronze wear plates reduce friction. Available with packed box or mechanical seal.

ROPER SERIES 3600 PUMPS

You'll profit more with dependable Roper Series 3600 Pumps on the job . . . they are speedy, quiet, and plenty rugged. Service-proved features such as self-lubrication, adjustable relief valve, hardened gears, and mechanical seal contribute to Roper dependability. Sizes range from 40 to 300 G.P.M.; pressures to 60 P.S.I.



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ROPER Rotary Pumps

NEW Catalogs & Bulletins

STEAM TURBINES . . . FURNACES BOILERS, STOKERS, BURNERS

1—Package Boiler — New compact, low cost package unit (oil or gas fired) for small space requirements is described in Bulletin DK-1. Pressures to 325 psi, steam capacities to 45,000 lb/hr. — E. KEELER CO.

2—Water Tube Boilers — Shop-assembled "package" gas-oil or combination fired units described in 8 page brochure. Pressures to 600 psig; 1,000 to 20,000 lb/hr — design features, installations. — VULCAN STEEL TANK CORP.

4—Steam Generators — Bulletin AXY-1 describes auxiliary equipment and design features of the Amesteam Generator for sizes 10 through 600 hp and illustrates how this integrated design reduces cost and increases life and reliability. — AMES IRON WORKS, INC.

11—Feedwater Treatment — Bulletin describes liquid and dry (Braxon & Flako) boiler feedwater treatment recommended for removal and prevention of scaling and corrosion during use of many types of water and for prevention of foaming and carryover. — ANDERSON CHEMICAL CO.

16—Small Boiler Performance — Brochure shows how the packaged Ljungstrom air preheater boosts performance. Boilers as small as 25,000 lb/hr can have advantages of regenerative preheating—saves fuel, boosts output, and permits use of lower grade fuels.—THE AIR PREHEATER CORPORATION.

23—Soot Blowers — Bulletin 1030 describes Vulcan T-30 retractable soot blowers, available in lengths up to 38 ft. Includes sectional drawings and special design features. — COPES - VULCAN DIVISION, BLAW-KNOX CO.

25—Packaged Boilers — Bulletin PSG-2 has line drawings, photos, and engineering data on portable type units from 10,000 to 40,000 lb/hr steam capacities. In standard pressures of 175, 250, and 375 psi. — HENRY VOGT MACHINE CO.

50—Coal Crushers — Catalog 784-C describes single and double roll crushers, swing hammer pulverizers for all sizes of plants. — JEFFREY MANUFACTURING COMPANY.

54—Collector System—Catalog gives advantages of Penaflo — reduces tube erosion, separates large particles, collects smaller particles; Separates large, high-carbon particles for refiring, and small flyash particles for disposal. — PRAT-DANIEL CORPORATION.

65—Self-Contained Boilers — 8 p brochure AD-162 describes company's line of Model CB boilers. Highlights design features, fuel flexibility, four-pass, forced draft design, unified electric and steam preheater, quiet vibrationless impeller, and hinged doors with built-in refractory. — CLEAVER-BROOKS CO.

86—Steam Generators — 68 p Bulletin B-56-5 covers large central station and industrial installations, including reheat and dual circulation for steam generators. — FOSTER WHEELER CORP.

88—Industrial Burners — General Bulletin 751, 16 pages — Describes and illustrates industrial oil burners, gas burners, combination gas and oil burners for boilers, dryers, stills, retorts, kilns, etc., and fuel oil pumping and heating units which go therewith. — NATIONAL AIROIL BURNER CO.

98—Blow-Off Valves — Bulletin B-426 describes valves widely used for low and medium pressures. No seat to score, wear, clog or leak.—YARNALL-WARING COMPANY.

FANS—PUMPS—COMPRESSORS HEATERS—HEAT EXCHANGERS

107—Proportioning Pumps—4 p brochure illustrates and describes company's proportioning pumps and package chemical feeding units. Includes applications and specifications. — BIRD ARCHER CO.

108—Active Air—Catalog 2046 shows how to put active air to work in buildings and shops. Direct drive exhaust fans, air circulators, and ceiling fans. — EMERSON-ELECTRIC.

120—Continuous Blow-Off Equipment — Publication No. 5700 shows how equipment can effect substantial savings in heat and fuel by returning the heat contained in the blow-off. System also maintains uniform dissolved solids concentration in boiler. Typical applications and lists of users are included. — COCHRANE CORPORATION.

123—Slurry Pump — Catalog describes the new SP-90 slurry pump which permits proportion of slurries in the mix tank to remain constant, with pumping rates variable from maximum to 1/5 of maximum. — MANZEL.

144—Fluid Drives — Catalog, 24 pages — Describes and illustrates Type VS Class 4 Gyrol fluid drives. Eight sizes are listed, with speeds to 1800 rpm and 100 to 2500 hp. — AMERICAN BLOWER CORPORATION.

152—Stainless Steel Pump — Bulletin 725.4 describes pump for economical handling of hot, corrosive or abrasive liquids; 9 sizes with capacities up to 720 gpm; heads to 200 ft. — GOULDS PUMPS INC.

Note Your New Reader SERVICE on Advertisements

156—Pumps & Pump-Motors — 12 p Catalog 957 illustrates and describes company's rotary pumps and hydraulic pump-motors. Specification charts also included. — GEO. D. ROPER CORP.

158—Submersible Pumps — 12 p bulletin covers four basic pump types; handy selection chart, units range from 5 to 900 hp and from 30 gpm capacity to 30,000 gpm and above.—BYRON JACKSON PUMPS, INC.

160—Boiler Feed Pumps—12 p Bulletin 122 describes and illustrates the type BFI high pressure pumps. Design features, service ratings and engineering data included.—PACIFIC PUMPS, INC.

167—Rotary Pumps — Bulletin 307—Describes the features and advantages, and outlines the engineering details of Blackmer rotary pumps. These have been manufactured since 1904 and incorporate the outstanding advantages of "automatic adjustment for wear," and economical replacement of parts. — BLACKMER PUMP CO.

170—Heat Exchangers — Bulletins 120 & 124 describe Aero units which cool liquids & gases by evaporative cooling with atmospheric air, removing heat at rate of input, and precisely controlling temperature. Solves problems of water availability, quality or temperature. — NIAGARA BLOWER CO.

INSTRUMENTS—METERS CONTROLS—REGULATORS

208—Water Level Alarms—Brochure D1 — Float operated low and high water level alarms and fuel cut-offs, for low and medium pressure boilers, tanks and other vessels. — RELIANCE GAUGE COLUMN CO.

212—Automatic Temperature Control — Data sheets describe versatile automatic indicating temperature control offering many sequence combinations—step-heating, heating and cooling, wide limit control, or temperature control plus operation of signal devices.—SARCO COMPANY, INC.

222—Pressure Regulators — Catalog 76 — Gives complete detailed information covering applications, operation and specifications of Reducing Valves, Pump Pressure Regulators and Back-Pressure Regulators. Included is a simple, practical method for selecting size of regulators. — MASON-NEILAN DIV.

236—Computing Relay—4 p product specification P99-3 describes features, application, and operating characteristics of computing relay for pneumatic control systems. — BAILEY METER CO.

248—Pump Pressure Regulators — Bulletin 5306 describes constant and differential pump pressure regulators for steam turbines, reciprocating and motor driven pumps. Complete sizing and capacity information as well as construction features. — LESLIE CO.

255—Annunciator Systems — Catalog 100B describes Panalarm annunciator system; includes use, data

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Equipment and Review Editor
SOUTHERN POWER AND INDUSTRY
806 Peachtree St., N. E.
Atlanta 8, Ga.

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158	160	167	170	208	212	222	236	248	255
284	287	290	305	306	307	312	344	350	368
371	392	393	404	423	429	430	443	446	460
467	470	493	504	509	512	523	561	568	576
596	601	604	610	614	661	666	691	700	704
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on operating sequences, enclosures, mechanical specifications, remote equipment and components, and performance features. — PANALARM DIV., PANELLIT, INC.

284—Liquid Level Controls — Bulletin F-2800 describes controls for use as high and low limit switches, to sound alarms, flash signal lights, start or stop fluid transfer pumps, or to operate control valves. — FISHER GOVERNOR COMPANY.

287—Color-Port Water Gage—Bulletin WG-1814 describes the new gage for high pressure boilers (up to 3300 psi). Gives full details on design and operation and shows how it gives greater visibility and greatly reduced maintenance requirements. — YARNALL-WARING COMPANY.

290—Small-Size Gauges & Receivers — Bulletin V5 covers new line of easy-to-read gauges and receivers which save panel space, make more compact groupings and still get accuracy and dependability. Five inch illuminated scales; multiple or individual mounting — draft, pressure & vacuum, differential pressure, temperature. — REPUBLIC FLOW METERS CO.

PLANT EQUIPMENT—WELDING TOOLS—PROCESS SPECIALTIES

305—Industrial Heating — Catalog 50, 50 pages — Gives data on the type and size of electric heating units and similar equipment for industrial heating needs. Detailed diagrams and photographs describe applications.—EDWIN L. WIEGAND CO.

306—Steel Buildings — Catalogs cover Series S buildings (clear span widths from 4-40 ft) featuring Steelox panel construction; and Series P buildings (clear-span widths up to 100 ft); fire resistant & weather tight; simplified design eliminates much job-site labor. — ARMCO DRAINAGE & METAL PRODUCTS, INC.

307—Condensate Drainage Control—Publication 6025 describes units for improving quality of heat transfer in process equipment through continuous return of condensate to boiler at high temperature and pressure. Lists many cases substantiating claim for increased heat transfer, more production with less fuel. — COCHRANE CORPORATION.

312—Low Temperature Welding — Wall chart TIS 2616 lists torch and arc welding applications for all metal-working jobs. Enables the weldor to adopt the best alloys and procedures for repairs. Helps stock clerks and purchasing agents concerned with welding alloy selection. — EUTECTIC WELDING ALLOYS CORPORATION.

344—Air Compressor — 8 p brochure illustrates and describes the Channel-Flo Compressor, a 2-stage, 200 psig rated motorcompressor available in 1½ and 2 hp sizes. Flange-mounted directly on driving motor. — INGERSOLL-RAND CO.

350—Industrial Space Heaters — Bulletin GC 4-55 describes complete line of oil or gas fired Thermobloc industrial heaters for any size job. Completely self-contained, fully automatic. — THERMOBLOC DIV., PRAT-DANIEL CORP.

368—Wrought Iron — "101 Uses for Wrought Iron" — Gives a brief, comprehensive review of why, how and where wrought iron is used, coupled with a discussion of its economic justification. — A. M. BYERS COMPANY.

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705	712	720	725	765	774	825	855	859	861
884	909	911	936	937	T-1	T-2	T-3	T-4	T-5
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Handy Return Cards

- **Tear Out and Mail Today! No Postage Necessary**

371—Storage Racks — How you can make your own with Tube-Strut universal clamps described in TSB-2. One clamp builds every type of storage rack. Used with ordinary pipe or tubing. — TUBE-STRUT DIVISION.

392—Metal Cutters — Catalog describes three heavy duty units for cutting almost anything in metal up to ¾" — rods, wire, chain, etc. — H. K. PORTER, INC.

393—Shredders, Grinders & Hashers — 16 page Catalog 907 contains information on reducing cork, pulp laps, wood chunks, rubber, citrus fruits, animal waste, bones, etc. — JEFFREY MFG. CO.

PIPING, VALVES, FITTINGS STEAM SPECIALTIES, TRAPS

404—Pipe Unions — Folder describes A-4 line of malleable iron unions; all seats ground; for 500 psi steam & oil at 550 F; maintenance costs minimized; ⅛" to 2" inclusive. — JEFFERSON UNION CO.

423—Reducing Valves — Bulletin 5302A describes pressure reducing valves that automatically maintain a constant reduced pressure of steam, air or gas. Describes other units available for maintaining constant differential pressures, for unloading, and for remote adjustment. — LESLIE CO.

429—Expansion Joints — 8 p Bulletin EJ-1915 describes Type W Gun-Pakt expansion joint which features an improved one-piece design of body and gland. Includes data on figuring expansion of pipe lines and suggestions for installing expansion joints. — YARNALL-WARING CO.

430—Check Valve — Catalog 30A highlights the "tilting disc" check valve for handling fluids or gases under wide range of pressures. — THE CHAPMAN VALVE MFG. CO.

443—PVC Fittings & Flanges — Corrosion resistant polyvinyl chloride pipe fittings & flanges covered in 12 p catalog, featuring characteristics, advantages, limitations, operating pressures, temperatures, field tests, etc. — GRINNELL COMPANY, INC.

448—Valve Performance Facts — 32 case histories covering valve installations throughout industry. — CRANE CO.

460—Pipe Covering — New expanded polystyrene insulation for low temperature applications particularly effective in resistance to vapor transmission and moisture absorption. Physical characteristics in 4-p folder. — MUNDET CORK CORP.

467—Valve Selecting Guide — Revised edition of Circular 555 (A.I.A. File No. 34) gives tables, technical data and general information on selection of valves, boiler mountings and lubricating devices.— THE LUKENHEIMER CO.

470—Aluminum Jacketing — Applicable for protecting lines, tanks, towers, or vessels. Booklet shows simplified inexpensive applications in process industries, commercial buildings, etc. — ASEECO, INC.

493—Unions & Valves — Complete company line of pipe unions and check valves covered in Catalog 56. New Four-Star lug nut unions & spring controlled check valves included. — CATAWISSA VALVE & FITTINGS COMPANY.

MAINTENANCE PACKING GASKETS, LUBRICATION

504—Bearing Stock — Catalog No. 52 describes cast bronze bearing, bars and special parts. Gives engineering data. — THE BUNTING BRASS & BRONZE COMPANY.

509—Rust Solvent — Data sheet describes "Liquid Wrench," a penetrating rust solvent that loosens rusted bolts, nuts, screws and "frozen" parts. Safe for all metals and alloys. — RADIATOR SPECIALTY CO.

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See Pages 81-82

512—Lubricator Vacuum Type Pumping Unit—If your plant is experiencing difficulty with visibility and excessive maintenance on lubricator sight glasses, the new 82 vacuum pumping unit will offer lower costs. Form 1263 gives principle of operation and advantages.—MANZEL.

523—Boiler Gaskets — Catalog describes wire-inserted woven asbestos and spiral wound metal-asbestos — for manholes, handholes and tube caps of all makes of stationary and marine boilers, water walls, economizers, etc. — THE BELMONT PACKING & RUBBER CO.

561—Return Line Corrosion — Bulletin CP-100 discusses Amine treatment, an effective and economical way to eliminate corrosion troubles. — THE BIRD-ARCHER COMPANY.

568—Mechanical Packings — Bulletin P-325 gives specific recommendations as to services, applications and temperatures on chemically-inert mechanical packings fabricated from Teflon — Chemlon Packings. Also provides information on pressures, dimensions and mechanical requirements. — CRANE PACKING CO.

576—Mechanical Sealing — Catalog 480, a valuable reference book for maintenance engineers illustrates types of Dura Seals for specific temperature, pressure and fluid conditions. — DURAMETALLIC CORPORATION.

596—Tube Cleaners & Expanders — Catalog 77 covers tubes in high pressure boilers, superheaters, economizers and other heat exchange equipment. Model 38 expander rolls and flares in single operation. — THOMAS C. WILSON, INC.

ENGINES, DRIVES POWER TRANSMISSION MATERIALS HANDLING

601—Fluid Drive — Bul. 9819 describes features of improved Type T Gyrol Fluid Drive for general industrial applications. Applications and advantages noted; rating charts give hp ranges for various engine and electric motor drive speeds. — AMERICAN BLOWER CORPORATION.

604—Motor Units — Catalog 51 describes motor units for accurate performance and longer, lower cost life for operation of valves, floorstands and sluice gates. — CHAPMAN VALVE MANUFACTURING CO.

610—Flexible Couplings — All metal couplings described in Catalog 51A have no wearing parts; offer freedom from backlash, torsional rigidity; free end float; smooth continuous drive; and visual inspection in operation. — THOMAS FLEXIBLE COUPLING CO.

614—Vertical Transportation — Elevator Catalog — Describes and illustrates details of passenger and freight elevators, escalators, dumbwaiters, and modernization and maintenance equipment for use in industrial, utility and service plants. — OTIS ELEVATOR CO.

661—D-C Crane Control — 8 p Bulletin GEA-6434 features precision

hoist, bridge and trolley control systems. — GENERAL ELECTRIC CO.

666—Electric Power Drives — Bulletin 185 contains cut-away drawings illustrating various features of variable speed and slow speed gear reduction units, and totally enclosed splash-proof motors. Includes mounting and control information. — STERLING ELECTRIC MOTORS.

691—Tug-Bar — Data sheet describes low-cost answer to load-handling in cramped areas. Weighs only 110 lb; handles loads up to 4,000 lb; motor driven wheels do the work. — WESTERN GEAR CORPORATION.

WATER TREATMENT, HEATING VENTILATING, AIR CONDITIONING REFRIGERATION, DUST & FUME CONTROL

700—Water Conditioners — 4 p brochure describes Anco water conditioners for hot-water and humidifying systems. Stop rust and corrosion; prevent discolored water. — ANDERSON CHEMICAL COMPANY, INC.

704—Water Conditioning — Brochure describes company's engineering services — zeolite water softeners, filters and purifiers, modernized and rebuilt water softeners, aerators and degasitors and process and boiler water conditioning. — SOUTHERN WATER CONDITIONING, INC.

705—Test Your Tower—Bulletin offers simple, proved method by which you can determine how closely your actual tower performance measures up to specified performance. Particularly applicable to operations geared to temperature of process cooling water. — THE MARLEY COMPANY.

712—Ion Exchange Equipment — Bulletin A-255 describes the various methods of ion exchange treatment which provide suitable boiler feedwater, process water, and purified solutions. — ILLINOIS WATER TREATMENT CO.

720—Power Roof Ventilator — 4 p Bulletin 550 illustrates and describes company's Centrilator, the centrifugal power roof ventilator with the exclusive "jet siphon." Includes capacity and dimension tables. — CLARAGE FAN CO.

725—Cooling Tower — 32 p Bulletin DT-57-1 describes induced-draft counterflow cooling tower. Describes construction and operation of all major parts, effects of recirculation and surroundings. Illustrated. — FOSTER WHEELER CORP.

765—Packaged Air Conditioners — 20 p Bulletin 6125 describes company's line of packaged air conditioning units. Design features are detailed and illustrated, and operating components are thoroughly discussed. — AMERICAN BLOWER DIV. OF AMERICAN STANDARD.

774—Refrigerating Units — Bulletin 97-F illustrates and describes low-pressure refrigerating units. — FRICK CO.

ELECTRICAL

825—Weather-Protected Motors — Bulletin 51B8606A describes features which contribute to outdoor dependability of company's weather-protected motors (Type FOD) in ratings from 250 to 900 hp. — ALLIS-CHALMERS MFG. CO.

855—Wiring Analyzer — 4 page bulletin describes Model 301 Adequate Wiring Analyzer which quickly, simply and easily tests wiring without confusing calculators or slide rules. — SPRAGUE ELECTRIC COMPANY.

859—FHP Motors — 16 p Bulletin GEA-6424 illustrates design advantages and shows components in integrated insulation system of general purpose fractional hp motors. Used on power tools, heating and ventilating equipment, compressors, fans, water pumps, and machine tools. — GENERAL ELECTRIC CO.

861—Electrical Protection System — Bulletin HCS—Describes "Fusetron" dual-element fuses which save recalibration and maintenance costs. Eliminates down-periods caused by needless blows and saves on installation costs. Available in all sizes from 1/10 to 600 amperes, both 250 and 600 volt types. Also in plug types for 125 volt circuits. — BUSSMANN MANUFACTURING COMPANY.

884—Portable Cords — Bulletin covers complete new line — Securityflex cords for severest applications; Industrial "all-purpose" cords for hard usage; and Service cords for shop appliances. — ANACONDA WIRE & CABLE COMPANY.

OPERATING AIDS SUPPLIES & MISCL.

909—Industrial Skin Cleanser—Folder describes Vi-Lan Clean, a non-alkaline, non-acid, all-purpose antiseptic skin cleanser that prevents dermatitis and other skin conditions. Self-service dispensing units. — DAMERON ENTERPRISES, INC.

911—Rescue Kit — Bulletin 733 describes unit and procedures for freeing persons trapped in cars, buildings, under machines, in elevators, etc. — H. K. PORTER, INC.

936—Stock & Weight Handbook — 84 pages, gives complete information on all sizes and shapes of stainless and carbon steel products normally carried by steel warehouses. Useful charts and tables. — WAREHOUSE DIVISION, ATLANTIC STEEL COMPANY.

937—Steel Measuring Tapes—Complete catalog describes full line of measuring tapes from 6 to 100 ft, including wide blade tape with upright measurements. — EVANS RULE CO.

New Catalogs for the Plant Engineer

FOR FREE INFORMATION—Circle code number on page 81 or 82

T-1—Diesel Air Compressor — 4 page brochure describes the JW-78 diesel air compressor, both portable and stationary units, of 78 cfm, 100 psi. — CERLIST DIESEL, INC., Burlington, N. C.

T-2—Heat Exchangers — 16 page booklet illustrates and describes heat exchangers for every process, refinery and power plant operation.— CONDENSER SERVICE & ENGINEERING CO., INC., 150 Observer Highway, Hoboken, N. J.

T-3—Precision Tools & Gages — 96 page Catalog 36M covers company's entire line of precision tool and gage equipment. — BROWN & SHARPE MFG. CO., Providence, R. I.

T-4—Waste Treatment Equipment — Illustrated Bulletin No. 315-11 outlines various methods of waste treatment — screening, grit & sludge removal, settling, skimming, floccu-

lation and flotation. Non-technical.—CHAIN BELT CO., Milwaukee 1, Wis.

T-5—Screw Conveyor — Bulletin No. 957 describes Flo-Tube screw conveyors for handling bulk materials from fine-mesh size up to 2 in. in diameter.—CANTON STOKER CORP., 300 Andrew Place, S.W., Canton 1, Ohio.

T-6—Axivane Fans — A.I.A. File No. 30-D-1 illustrates and describes adjustable blade, vaneaxial fans for commercial and industrial applications. — JOY MANUFACTURING CO., Oliver Bldg., Pittsburgh 22, Pa.

T-7—Tubar Cranes — 4 page bulletin describes and illustrates Tubar Cranes, including capacities, dimensions and full specifications. Available in 8 different models from ½ to 3 ton capacities. — UHRDEN, INC., TUBAR CRANE DIV., Dennison, Ohio.

T-8—Industrial Refuse Burners — Bulletin M-1 describes the action and construction of the conical type burner, long used by sawmills and now finding favor among many industries because of safety and complete combustion. — REES BLOW PIPE MFG. CO., 2929 5th St., Berkeley, Calif. and Box 225, Memphis, Tenn.

T-9—Steel & Tank Service — Brochure describes company's abilities at painting, repair work and other types of maintenance of water tanks. — STEEL & TANK SERVICE CO., 118 W. 24th St., Charlotte, N. C. and 829 Clayton Ave., Nashville, Tenn.

T-10—Variable Pitch Drives — Catalog V-183-A illustrates and describes complete line of variable pitch drives. Includes complete specifications, engineering information and tables of practical stock drive combinations for easy selection. — BROWNING MFG. CO., Maysville, Ky.

T-11—Commercial Glasses—Revised Bulletin B-83, "Properties of Selected Commercial Glasses," discusses mechanical, thermal, electrical and chemical properties of glass. Includes viscosity temperature curves for several commercial glasses and heat transmission data. — CORNING GLASS WORKS, Technical Products Div., Corning, N. Y.

T-12—Vertical Service Pumps — Bulletin SCP describes company's short coupled vertical service pumps. Explains the many uses of service pumps, including suggested installation plans, existing installations for oil refineries, pipe lines,

eats HEAT

BELMONT "Compressor"

ask your BELMONT Distributor

such leading Packing Distributors as:

Indianapolis Belting & Supply Co. in Indianapolis

and

Walter B. Gallagher Co. in Philadelphia

are ready to serve you promptly and helpfully, wherever you are.

Looking for an air compressor rod packing that stays flexible under intense dry heat?

Belmont "Compressor" No. 760 withstands such gruelling service—and protects compressor rods from premature wear.

This asbestos packing is lubricated strand by strand, braid by braid, layer by layer—to retain its flexibility and good sealing qualities.

Use it for longer life, less maintenance. Write for Catalog 56.

The Belmont Packing & Rubber Co.
Butler & Sepviva Sts., Phila. 37, Pa.

BELMONT

Bulletins (Cont'd)

municipal and private water works systems. — LAYNE & BOWLER, INC., Memphis 8, Tenn.

T-13—Electric Thermostat — 4 page Bulletin RT-808 gives information on the installation and application of the electric thermostat Model F2, designed to control temperature and movement of heavy liquid where flow or agitation must begin before the selected temperature is reached. — ROBERTSHAW-FULTON CONTROLS CO., 110 East Otterman St., Greensburg, Pa.

T-14—Storage Bins — Bulletin illustrates and describes company's Super-Concrete Stave Storage Bins for industry. Explains construction of bins, how they are engineered to purchasers' requirements, lists prominent users and gives tables of capacities in relation to bin diameters, heights, and weights of materials. — NEFF & FRY CO., 136 Elm St., Camden, Ohio.

T-15—Material Handling System — 12 page Catalog No. 83 illustrates and describes Work-O-Matic units which simplify, speed and integrate production, storage, material movement and disposal.—UNION METAL MFG. CO., Canton 5, Ohio.

T-16—Floor Protection—Folder contains fact sheets giving information covering Watco Wood Products which are deep penetrative treatment for all new and old, interior and exterior surfaces that tighten wood, solidifies, fills and seals the pores and strengthens the fibers so that resistance to surface influence is greatly increased. — WATCO-DENNIS CORP., 1640 Twentieth St., Santa Monica, Calif.

T-17—Wire Rope Recommendations — 16 page Bulletin DH-128-B contains data on construtions features, applications, diameters, etc., of complete line of Tru-Lay Preformed Wire Rope, Accessories and Dualoc Boom Cable Assemblies. — AMERICAN CHAIN & CABLE CO., INC., 929 Connecticut Ave., Bridgeport 2, Conn.

T-18—Idealarc — 4 page brochure contains specifications and construction details of Idealarc, a versatile welder which has both a-c and d-c welding current available at the flick of a switch. — LINCOLN ELECTRIC CO., Cleveland 17, Ohio.

T-19—Car Pullers — 32 page booklet describes several installations and various types of car pullers for moving freight cars, barges, scrap buggies, furnace cars and many types of industrial transfer cars. — HEWITT-ROBINS, INC., 666 Glenbrook Rd., Stamford, Conn.

T-20—Propellers — 4 page Bulletin 510 illustrates and describes large-diameter Al-Metal propellers for cooling towers and heat exchangers. — AEROVENT FAN CO., INC., 700 East Ash St., Piqua 68, Ohio.

T-21—Ferrotraps — Bulletin No. B-605 describes Ferrotraps, the liquid handling Magnetic Separator which protects against fine iron and tramp iron contamination. — ERIEZ MFG. CO., Erie, Pa.

T-22—Power Sweepers — 4 page brochure illustrates and describes company's line of power sweepers in L. P. Gas and Battery powered models. — WAYNE MFG. CO., 1201 E. Lexington St., Pomona, Calif.

T-23—Pressure Regulators — Form 1011 gives information on pressure regulators. Includes selection data with photographs presented on 3 principal types of main valves and pilots, line drawings of three suggested applications of regulators, and a steam capacity table for selection of main valve size. — SPENCE ENGINEERING CO., INC., Walden, N. Y.

T-24—Oil Coolers — Bulletin 12C describes complete line of oil coolers used for cooling fluids in lubricating, power and processing applications.—SCHUTTE & KOERTING CO., Cornwells Heights, Bucks County, Pa.

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See Pages 81-82

T-25—Auto-Nailer — Brochure illustrates and describes various types of Auto-Nailers which turn out 3 nails a second, making them as it goes along. — AUTO-NAILER CO., 278 Marietta St., N. W., Atlanta 3, Ga.

T-26—Silicone Grease—4 page Form No. 6-206 is devoted to the properties and performance of Dow Corning 41, a silicone-based grease. Developed for high-temperature, slow-speed bearings. — DOW CORNING CORP., Midland, Michigan.

T-27— Dust Separator — 12 page Bulletin 576 deals with "HV" Dust Separator. Includes discussion of design improvements and applications of this heavy duty cyclonic dust separator, air flow resistance and dust recovery curves, temperature and pressure correction formula, selection chart, dimensions, supports and accessories. — DAY SALES CO., 810 Third Ave., N. E., Minneapolis 13, Minn.

T-28—Supervisory Control—Bulletin 240-P2A describes the centralized, economical control of widespread, remote operations as accomplished by Synchro-Scan Supervisory Control System, which remotely controls the operation of any combination of pumps, valves, gates, generators, circuit breakers, and similar devices. — BUILDERS-PROVIDENCE, INC., 345 Harris Ave., Providence 1, R. I.

T-29—Fire Protection Systems — 8 page Bulletin 78 explains how an investment in automatic sprinkler protection can amortize itself out of insurance savings and bring many other economic benefits. — AUTOMATIC SPRINKLER CORP. OF AMERICA, Youngstown 1, Ohio.

T-30—Corrosion Resistant Lining — Bulletin PF 17 discusses inexpensive and enduring solution to costly corrosion problems in industry — C-17 Pre-Krete, a low-soluble cement-base lining widely used in lining the interiors of steel water heaters, tanks, vats and other vessels handling bulk liquids. — POCONO FABRICATORS, INC., East Stroudsburg, Pa.

T-31—Electrical & Lubricating Devices—8 page Catalog No. 55 illustrates and describes some of company's electrical and lubricating devices. Includes constant level, gravity feed, thermal, bottle, multiple feed, vari-feed, wick feed and "Lub-O-Jet" oilers, fuses, reducers and clamps.—TRICO FUSE MFG. CO., 2948 N. 5th St., Milwaukee 12, Wis.

T-32—Compressor Needs & Air Consumption—Bulletin AC-15 gives two handy charts, one for figuring compressor needs and another showing estimated free air consumption for 30 common shop jobs.—GARDNER-DENVER COMPANY, Quincy, Ill.

T-33—Weldless Repairs — Technical Bulletin No. 14 describes the new method of making weldless repairs to iron and steel tanks, conduits, containers and surfaces. Gives details of the repair procedure from start to finish, including preparation of the damaged metal, preparation of the glass cloth patches, mixing of the resin, and curing of the final patch. — SMOOTH-ON MANUFACTURING CO., 572 Communipaw Ave., Jersey City 4, N. J.

FUTURE EVENTS
of Engineering Interest

Sept. 9-23: 12th Annual Instrument-Automation Conference & Exhibit. Instrument Society of America, Cleveland Auditorium, Cleveland, Ohio. Jim Irving, Chairman, Publicity Committee, Room 3120, 20 No. Wacker Drive, Chicago 6, Ill.

Sept. 20-21: 39th Annual Meeting. Public Utilities Association of the Virginias, Greenbrier Hotel, **White Sulphur Springs, W. Va.** R. W. McKinnon, Exec. Secy., PUA of the Virginias, 5 Franklin Rd., Roanoke, Va.

Sept. 22-25: Petroleum - Mechanical Engineering Conference. ASME, Hotel Mayo, **Tulsa, Oklahoma.**

Sept. 27: Oklahoma Regional Meeting. Natural Gasoline Association of America, Skirvin Hotel, **Oklahoma City, Okla.** William F. Lowe, Secy., Natural Gasoline Assoc. of America, 421 Kennedy Bldg., Tulsa 3, Okla.

Oct. 25: Southern Regional Meeting. Natural Gasoline Association of America, Washington-Youree & Captain Shreve Hotels, **Shreveport, La.** William F. Lowe, Secy., NGAA, 421 Kennedy Bldg., Tulsa 3, Okla.

Nov. 4-8: 39th Annual National Metal Exposition & Congress. American Society for Metals, International Amphitheatre, Chicago, Ill. W. H. Eisenman, Secy., ASM, 7301 Euclid Ave., Cleveland 3, O.

Nov. 14-15: 6th Annual Conference. Textile Ind. Subcommittee of Gen. Industry Applications Committee of AIEE and N. C. State College, Riddick Laboratory Auditorium, Raleigh, N. C. I. S. Bull, Firestone Textiles, Div. of Firestone Tire & Rubber Co., Gastonia, N. C.

Nov. 22: Panhandle Plains Regional Meeting. Natural Gasoline Association of America, Herring Hotel, **Amarillo, Texas.** William F. Lowe, Secy., NGAA, 421 Kennedy Bldg., Tulsa 3, Okla.

YOU GET more* WHEN YOU BUY BEARINGS FROM YOUR Bunting® DISTRIBUTOR

* more dependability

YOU CAN DEPEND ON BUNTING, the Bunting distributor and on Bunting Stock Bronze Bearings and Bars. The very highest standards of metallurgical and manufacturing processes assure uniform high quality in Bunting Cast Bronze and Bunting Sintered Powdered Oil-filled Bronze Bearings and Bars. Bunting distributors are the leading responsible distributors in their respective areas. They carry ample stocks at all times.

Your Bunting distributor is listed in the classified section of your telephone directory usually under Bars—Bronze, and Bearings—Bronze. Two modern Bunting factories and eleven Bunting Branch Warehouses expedite distribution in all areas. Write, or ask for catalogs giving complete dimensional listings and technical data.

Simplified standardized size listing including all ASTM sizes—an exclusive Bunting feature.

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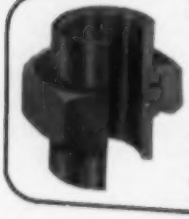
PERFECT SEAL

Unions

HOT FORGED from solid, rectangular steel bars, designed and produced for dependable, long-life service under the severest piping conditions!

A TYPE FOR EVERY USE!
FOR ALL PRESSURES!
FOR ALL TEMPERATURES!



Standard & Double Extra Heavy
UNIONS

Available with screwed or socket weld ends. 3000-lb. sizes ⅛" to 3"; 6000-lb. sizes ⅛" to 2".

ORIFICE UNIONS

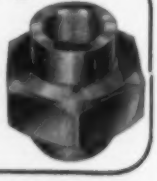
With screwed or socket weld ends. 3000-lb. and 6000-lb. service.

MALE & FEMALE UNIONS

With steel-to-steel, bronze-to-steel, stainless steel-to-steel or orifice seats. 3000-lb. service only.

FULL STAINLESS & FULL ALLOY STEEL UNIONS

With screwed or socket weld ends. 3000-lb. and 8000-lb. service.



WRITE FOR CATALOG 56
Showing the Complete Catawissa line of Perfect Seal Products
CATAWISSA VALVE & FITTINGS COMPANY
950 MILL ST., CATAWISSA, PA.

NEW Product Briefs

Fire Hose

H-1 A new fire hose with increased flexibility and reduced weight has been developed by **Hewitt-Robins, Inc.**, Stamford, Conn., for use in chemical plants, oil refineries, and the marine industry.

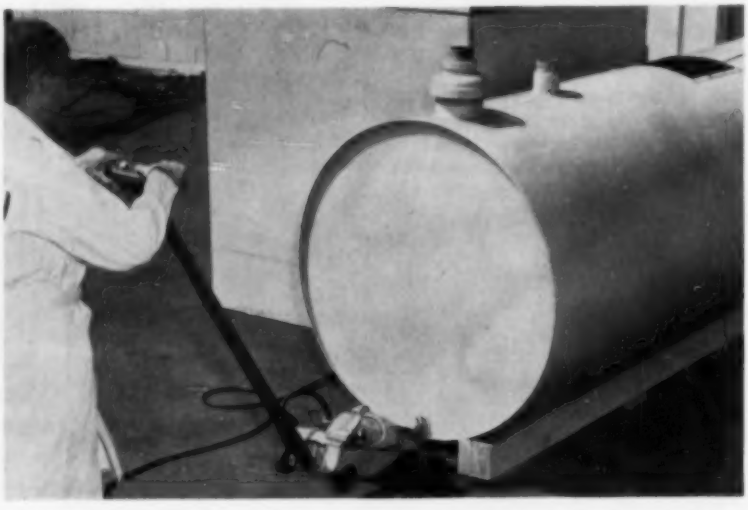
The hose has a carcass of dacron and cotton fabric with unusually high tensile strength, and a neoprene synthetic tube which makes the hose suitable for water or oil service. The cover is a newly developed neoprene compound highly resistant to heat, flame, acids, oxidation and abrasion.

Built to withstand pressures up to 500 pounds, the hose is resistant to oil, gasoline and chemicals.

Packaged Steam Generator

H-2 Featuring 3 pass design with gas vent in the rear, **Erie City Iron Works,** Erie, Pa., has announced the "FT" fire tube packaged steam generator. It combines oil, gas or combination burner with all safety controls and instrumentation piped, wired and factory assembled.

Manufacturer states that every unit is factory fire-tested with burner and fuel specified, ready to go to work when it reaches your plant. The Erie City "FT" has 5 full sq ft of heating surface per developed hp. It is a pressurized unit using forced draft to provide precise control of excess air and CO_2. Catalog 56A gives full details.



Tug-Bar Handles Loads in Cramped Quarters

H-3 A new low-cost answer to load-handling in cramped areas is the Tug-Bar, a motorized unit manufactured by **Western Gear Corporation,** 117 N. Palmer St., Houston 3, Texas.

The lightweight unit (only 110 lb) consists of a reduction gear powered by either an ac or dc motor, depending on customer requirements. All types of heavy equipment weighing up to 4,000 lb can be moved easily. Several types of lips are available for all types of jobs. Motor driven wheels do the pushing and pulling.

Photo shows how an oil tank weighing more than 3,500 lb was easily moved by one man in a fraction of the time normally required by other types of equipment.

"Galvinoleum" Coatings

H-4 The long time paint peeling "headache" is now a thing of the past with the introduction of Galvinoleum Coatings by the **Rust-Oleum Corporation,** 2799 Oakton Street, Evanston, Illinois.

Specially formulated to be applied right over brand new, unpainted Galvanized, Aluminum, or Terne Plate surfaces, Galvinoleum Coatings are available in red, gray, green, and metallic colors. Rust-Oleum 575 outside white, or any high-quality oil base house paint, may be used over Galvinoleum to match desired trim color.

For More Free Data CIRCLE CODE NO. on the Handy Return Card — Page 81

Plug-In Disconnect Unit

H-5 A single bus duct plug-in disconnecting unit that can be used for all ratings from 15 amperes, 250 volts to 100 amperes, 600 volts has been announced by **Federal Pacific Electric Company.** Designed to further simplify inventory and installation problems, the device accepts the same E and F frame molded case StABreakers now used interchangeably in the company's line of AB-Is and distribution panelboards.

Enclosures are supplied with an interlocking cover that prevents opening when the breaker is in "on" position. A positive handle mechanism, that may be padlocked, plainly indicates "on", "off" or "tripped" breaker position.

Panalarm Annunciator pinpoints process "off-normals"

In the process industries and among users of automatic machinery, trouble is minimized when it's caught early. That's the purpose of the Panalarm Annunciator System—a continuous monitor of your process.

One typical adaptation of the modular Panalarm system is engineered to differentiate between the first "off-normal" and subsequent "off-normals" caused by the first. This feature allows instantaneous recognition of the prime source of trouble in a "chain reaction."

Another adaptation is designed specifically for motor start-up and shutdown. It has also been successfully adapted for supervisory control, pump control and programming.

Your Panalarm sales engineer will be happy to make a survey of your requirements to determine whether a Panalarm system can aid productivity and safety in your process. For electrical and mechanical data on standard systems, request Catalog 100B on your letterhead.

PANALARM

Division of
PANELLIT, INC.
7411 N. Hamlin Avenue, Skokie, Illinois
Panellit of Canada, Ltd., Toronto 14

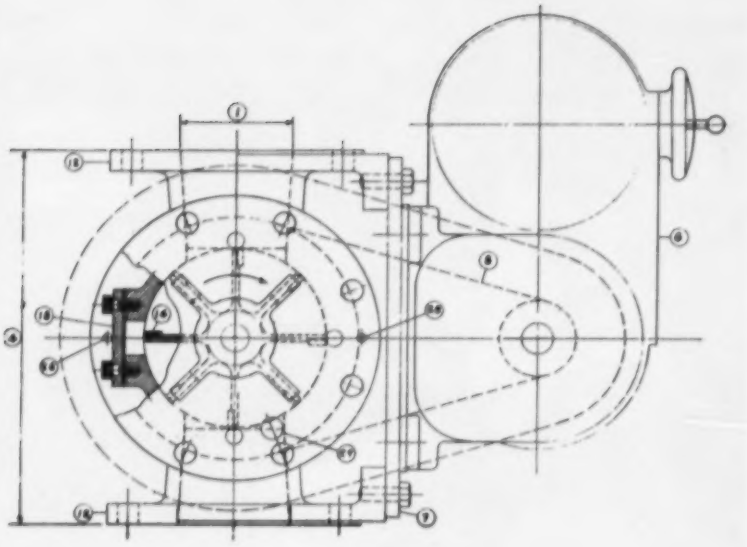
Engineered Information Systems for Industry

Graphic Panels, Control Centers

Panalog Information Systems

Panellit Service Corporation

New Product Briefs (Continued)

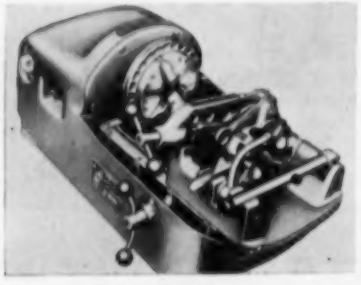


Rotary Feed Unit

H-6 A new, compact, periphery sealed, eight pocket rotary feed unit of the air lock type for feeding bulk chemicals and other materials into industrial processes at differential pressure to 25 psi has recently been developed by **Beaumont Birch Co.**, 1505 Race Street, Philadelphia, Pa.

Unique design features are the mating, V-shaped, floating, Teflon seal rings that extend service life four to six times over previous models and the outside adjusting screws that permit adjustment of floating seals for maintenance of a perfect seal without dismantling the feeder. Adjustable tips on the rotor blades are available in nylon, Teflon, neoprene, rubber, stainless steel or monel and hours of downtime are saved since the tips can be adjusted easily for wear through a gasketed door without removing the rotor from the feeder.

The unit, called the S.T.T. type, is available in 4", 6", 8" and 10" sizes combined with a new Reeves Vari-Speed Motordrive with ratios up to 10 to 1. Other types of constant or variable speed motors can be furnished if desired. The S.T.T. type is said to be the only periphery sealed rotary feeder that will hold differential pressures of 2 psi and above.



Pipe & Bolt Machine

H-7 The new Beaver S - 4 Speed-O-Matic Pipe and Bolt Machine features a new Universal-type die head which has three sets of high-speed steel dies and threads from ½" to 2".

Manufactured by **Beaver Pipe Tools, Inc.**, Warren, Ohio, the new Beaver S-4 Speed-O-Matic uses one Universal die head and three sets of duo-type dies (½" x ¾") (1" x 1¼") and (1½" x 2"). Duo-type and mono-type die heads are also available.

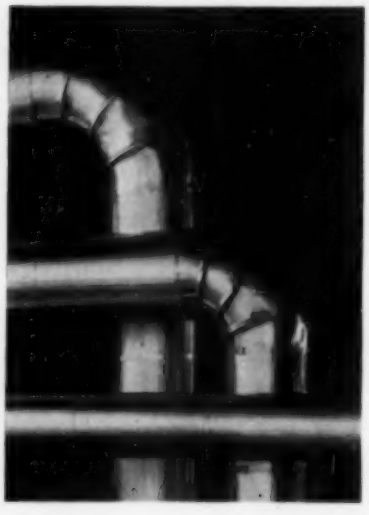
Cutoff, die heads and reamer are all pivot mounted and swing out of the way when not needed. A special oiling tube directs cutting oil right to the threading dies. Oil shuts off automatically when tube is moved out of position.

The Beaver quick-acting Power Grip Wrenchless Chuck is standard equipment. It quickly gives a positive, safe grip to the work whether the machine is forward or reverse.

Aluminum Jackets Protect Insulation on Elbows

H-8 Ell-Jackets in 23 sizes are being produced by **Childers Manufacturing Co.**, Box 7467, Houston 8, Texas, as an economical answer to the problem of protecting the insulation on elbows.

Childers' Ell-Jackets are deep-drawn from .020 aluminum and are manufactured for both 90° and 45° ells and have factory-applied moisture barrier. They give positive weather-tight protection. Aluminum sheet metal screws are used to apply. No special tools are required.



The Ell-Jackets are a new addition to the company's extensive line of aluminum weather-proof jacketing for insulated lines, towers, vessels and tanks.

Utilities and the process industries have long had the problem of abuse and damage to insulation on elbows. Conventional method of protecting insulation invites physical abuse, which is intensified by the frequent projection of the elbows into areas where there is movement and activity. Vibration of the lines and shrinkage of the insulation are additional factors which have in the past contributed to the problem of protecting insulated elbows. Frequent and costly repairs are the result. The new two-piece Ell-Jackets give positive weather-tight protection.

They are manufactured in 23 sizes to cover all lines having the 1½" to 10" nominal pipe size and insulation from 1" to 3" thick.

For More Free Data CIRCLE CODE NO. on the Handy Return Card — Page 81

— the FT-100. This new truck is designed for heavy-duty work characteristic of steel mills, factories, warehouses, stevedoring, and any other place where heavy loads have to be handled.

The FT-100 has a heavy-duty, welded industrial-type frame. The 230 cu in. Allis-Chalmers engines, available in Diesel, gasoline or LP gas fuel models, provide the high torque at normal engine speed that is needed for heavy work and up grades.

A new roller type "extra lift" mast that gives more lift without increasing the overall lowered height of the unit is available in three standard heights. The standard ITA shaft-type fork mounting carriage permits the use of a wide range of standard attachments.

The truck has a 2-speed, constant mesh transmission that provides easy shifting. Power shift transmission, power steering, and a No-Spin Differential are available as optional equipment.

Re-Roofing Method

H-9 Improvement of its Vulca-Dek system to simplify installation work and further reduce re-roofing costs, is announced by **The Monroe Company, Inc.**, 10703 Quebec Ave., Cleveland 6, Ohio.

The process permits installation of new roofs right over old ones. It eliminates necessity for and expense of removing old roofs before work can be begun on new built-up roofs and is said to cut roof replacement expense by as much as 55%. The Monroe process does away with heating of roof coating, hot mop applications and use of gravel. Consequently, there is no fire danger.

Basis of the improved Vulca-Dek method is the recent development by Monroe of a new type of Hold-Tite sealing cement. This employs new plastics which render it even more adhesive than its predecessor materials. Monroe advises that Hold-Tite virtually vulcanizes new felt to old surfaces in addition to bonding individual felt piles firmly together.

10,000-lb Lift Truck

H-10 Production has started at the Harvey, Ill., Works of the **Allis-Chalmers Manufacturing Co.**, Milwaukee, Wis., on a new 10,000-lb capacity lift truck

FLAME RETENTION

COMBUSTION EQUIPMENT

ENGINEERED BY THE WEBSTER ENGINEERING COMPANY

COMBUSTION with SAFETY

Unparalled safety is but one of the features of WEBSTER'S revolutionary non-premixing ring gas burner incorporating flame retention regardless of air velocity.

Factory assembled Forced Draft Series H packaged units are available for Gas, Rotary Oil or Combination. Other variations soon to be available.

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Division of SURFACE COMBUSTION CORPORATION, Toledo, Ohio

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Sand — anthrafilt — quartz — activated carbon — taste and odor removal — condensate oil removal

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Increased capacities of older units as much as 300% (depending on type of zeolite) standard valve nests — multiport valves — semi automatic and fully automatic

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★ **Domestic Softeners — all types**
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St. Petersburg, Fla.

Southern Water Conditioning, Inc.,
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Company Name _____

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New Product Briefs (Continued)

Relocating a machine tool with a Peerless Pal. Pull is uniform and smooth. Note compactness of "packaged" puller. Container is also large enough to hold a snatch block.

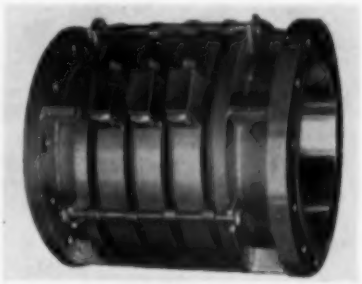
Versatile Lever Puller

H-11 Designed for minimum headroom and to permit operation of the handle in any position of a complete circle, The Peerless Pal lever puller by **The Harrington Company,** Plymouth Meeting, Pa., can be used to handle loads in both open and confined spaces.

The light-weight puller, available in ¼ and ½ ton capacities, is a compact tool for lifting, lowering and dragging in industrial and power plants.

Handle is detachable. Snatch block, which doubles capacity, can be installed without tools. The tubular handle contributes to safe operation. It begins to bend when puller is overloaded and before the unit is harmed, breaks at 60% overload.

Standard hook travel for both units is five feet. Friction brake holds a load at any location and lowers it smoothly. The ¼ ton unit weighs 5¾ lb; the ½ ton weighs 11¾ lb.



Self Equalizing Expansion Joints

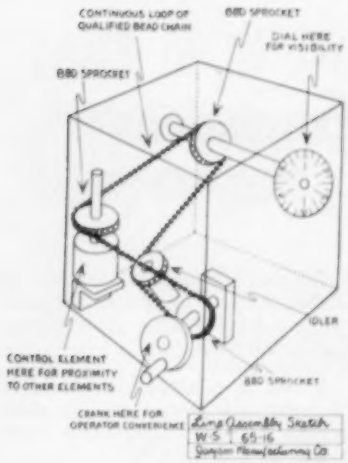
H-12 A line of improved corrugated self equalizing expansion joints for power and process piping systems is available from **Zallea Brothers,** 815 Locust St., Wilmington 99, Del.

In protecting piping and related equipment against damage due to temperature change, the joints employ equalizing rings to distribute pipe line expansion equally to all of the corrugations. This prevents overcompression of the corrugations beyond their design limit.

The equalizing rings also support the roots of the corrugations against internal pressure. This permits the use of thinner metal in the bellows, giving the self equalizing expansion joints lower flexing stresses and thus longer operating life.

Zallea Self Equalizing expansion joints feature four major improvements over previous models. They are: (1) 100% longer life, (2) 30% length reduction, (3) 30% less weight, and (4) greater stability at high pressures because of the reduction in ratio of length to diameter.

Made from stainless steel, the joints are available in sizes from 3-in. dia to 72-in. dia in single or double units. They are used for pressures up to 300 psig and temperatures up to 1600 F. Copper Self Equalizing expansion joints — for use with copper and brass piping — are available from 3-in. to 24-in. dia in both single and double units. Maximum operating pressures for copper expansion joints is 125 psig and 406 F.

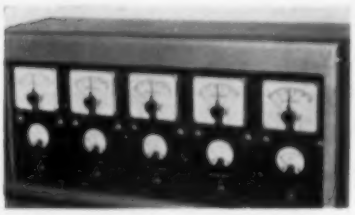


Bead Belt Drives

H-13 Combining close-tolerance bead-chain with bead belt sprockets, **Voland & Sons, Inc.,** 32 Relyea Place, New Rochelle, N. Y., are providing positive synchronous drives without gearing.

The sketch illustrates 4 bead belt drive sprockets and a loop of bead chain replacing 8 gears, bearings and supports. While the bead belt drives are not suitable to extremely high-speed or high-torque applications, they do make possible 3-dimensional drives with complete synchronization of the various elements.

Where torque requirements and operating speeds are low, they offer a quick and economical way to couple misaligned shafts, convert from one type of motion to another, counter-rotate shafts, obtain high ratio drives and overload protection, and to control switches and mechanical counters.



Harmful Gas Detector

H-14 A system which warns against excessive accumulations of harmful gases, designed for permanent installation in boats, industrial plants and institutions, again is being manufactured by **Atlas Laboratories, Inc.,** Houston, Texas.

One of the features of the unit, which is called the Atlas Permanent Gas Detector, Model 520, is its flexibility. The panel may be large or small to suit the location. A loud, outside warning alarm may be incorporated. Or, it may be designed to open or close valves, turn on fans, open doors or operate other electrically-controlled devices.

It consists of an instrument control board and detector stations which are connected to the control board with a three-wire conductor cable.

In industrial operations, or in schools, hospitals and hotels, the main panel may be situated near a telephone switchboard or in a control room.

For More Free Data CIRCLE CODE NO. on the Handy Return Card — Page 81

Hastings Vacuum Gauges With Relay Control

H-15 Vacuum Gauges with single-contact relay control for auxiliary circuits are available for the three general use ranges, from **Hastings-Raydist, Inc.** of Hampton, Virginia. Ranges available are 0-100 microns Hg (Model CL-1), 0-1000 microns Hg (Model CV-1), and 0.1-20 mm. Hg (Model CP-1).

An adjustable contact arm on the meter can be preset for control at any point within the range of the instrument. Contact closes when the vacuum pressure reaches the preset position. This activates a single-pole, double-throw relay to auxiliary circuits having a total capacity up to 5 amps. at 125 volts. The instrument continues its control until pressure is brought back into the selected range and contact released by manual reset. The relay circuit is suitable for operating pumps, alarm lights, control units, etc., in the vacuum system.

LUBRIPLATE 130-AA

affords machine parts and bearings real protection against rust and corrosion. It is a grease type lubricant that possesses the utmost in water and acid resistance. It has exceedingly high film strength. Due to the marked adhesiveness and water resistance of LUBRIPLATE 130-AA, it does not wash off readily, hence is the ideal lubricant in the presence of moisture.

REGARDLESS OF THE SIZE AND TYPE OF YOUR MACHINERY, LUBRIPLATE LUBRICANTS WILL IMPROVE ITS OPERATION AND REDUCE MAINTENANCE

For nearest LUBRIPLATE distributor see Classified Telephone Directory. Write for free "LUBRIPLATE DATA BOOK"... a valuable treatise on lubrication. LUBRIPLATE DIVISION, Fiske Brothers Refining Company, Newark 5, N. J. or Toledo 5, Ohio.

New Plants & Expansions

South Atlantic

Marshall Street Sewage Treatment Plant to be erected in **Clearwater, Fla.** at a cost of $673,775 . . . $11,000,000 expansion for **People's Gas System** of **Tallahassee, Fla.**

Georgia Coastal Natural Gas Corp. constructing $10,000,000 natural gas pipeline system in **Alma, Ga.** . . . $3,895,000 transformer manufacturing plant under construction in **Athens, Ga.** for **Westinghouse Electric Corp.** . . . $100,000 steel fabricating plant for **Techsteel Co.** of **Atlanta, Ga.** . . . In **Claxton, Ga.** $100,000 feed mill for **Scott Farm Supply** . . . $9,000,000 mining installation planned by **Glidden Co.** for 7,000 acre tract in **Cumberland Island, Ga.** . . . **Douglas Wood Preserving Co.** to erect $100,000 wood treating plant in **Douglas, Ga.** . . . $1,000,000 crushed stone operation planned in **Macon, Ga.** by **Weston & Brooker Co.** . . . $500,000 plant for **Diamond Furniture Co.** underway in **Swainsboro, Ga.**

Carling Brewing Co. planning multi-million dollar brewery on 40 acre tract in **Baltimore, Md.** . . . 40,000 sq ft plant for **Raleigh Manufacturers, Inc.** planned for **Anne Arundel County, Md.** — to cost $300,000.

$1,000,000 office and warehouse building in **Charlotte, N. C.** for **Burwell & Dunn Co.** of McKesson & Robbins, Inc.

September completion scheduled for $1,000,000 addition to **Cryovac Co.** plant in **Simpsonville, S. C.**

$3,000,000 foil carton mfg. plant for **Reynolds Metals Co.** planned for **Bellwood, Va.** . . . **Flight Research, Inc.** planning $300,000 plant in **Richmond, Va.**

$1,100,000 addition underway for **International Nickel Co.** in **Huntington, W. Va.** . . . $14,500,000 **Hildebrand Lock & Dam** being constructed in **Morgantown, W. Va.** . . . **Olin Mathieson Chemical Corp.** constructing $231,000,000 chemical plant in **Clarington, W. Va.**

East South Central

$1,259,422 **Aircraft Control & Warning Station** to be erected at **Dauphin Island, Ala.** . . . November completion scheduled for $750,000 Canning Plant for **Sinclair Refining Co.** at **Port Birmingham, Ala.** . . . **Alabama Metallurgical Corp.** multi-

YOUR FINGER IS ON THE PULSE OF YOUR BOILERS with *ELLISON* DRAFT GAGES ON THE JOB!

Proper combustion of fuels is dependant upon draft—Ellison Gages show you the draft condition at all times—they are easier to read, accurate, dependable.

Straight-line and Dial types—bell actuated and diafram actuated—built for durability and accuracy. Exclusive features such as transluscent glass scale, unitized mechanism that can be slipped out of case, practical illumination, nonfogging and dust sealed. A bank of Ellison Straight-Line Draft Gages at the South Shore Destructor Plant, Brooklyn, N.Y., is shown. Send for Bulletins 122 and 124.

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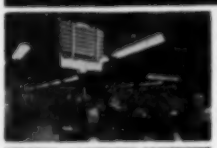
PANELBLOC



SUNNY AND WARM IN YOUR INDUSTRIAL AND COMMERCIAL AREAS

It's always fair weather in plants and factories heated by Panelbloc, the infra-radiant unit that "heats like the sun." Panelbloc heats objects—not the surrounding air. Thermostatically controlled. Uses any commercial gas. No moving parts means long life. Install Panelbloc, and banish heating worries. Write for information today.

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For Storage Tanks, Vats, Towers, etc.

Call on *Southern*

Southern fabricates and erects all types of special steel work. Consulting engineering service available.

Highest Quality and Prompt Service Since 1911

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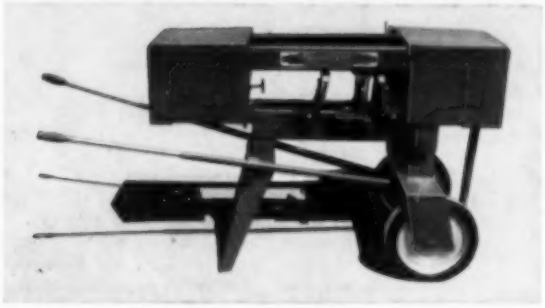
TAKE IT TO THE JOB...

KALAMOBILE —a metal-cutting band saw that's truly portable—handier than ever!



Here's the popular Kalamazoo Model 610 metal-cutting band saw on the handiest chassis you ever saw. Provides greatly increased portability with its rubber-tired 12-inch wheels and telescoping handles. One man shifts the 610 from job to job with ease. Capacity 6" Rounds—10" Flat.

610-D without coolant attachment.
610-W with coolant attachment.
Kalamobile chassis M6A fits all 610 models.

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Kalamazoo TANK and SILO CO.

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for Tanks or Smokestacks call **FINNIGAN** *Specialists*

TANKS,
SMOKESTACKS
PIPING, BREECHING
PLATE WORK
WATER HEATERS
BOILERS

Skilled craftsmanship and over 60 years of experience made the erection of the two 40' 0" (dia) x 30' oil storage tanks and three smoke stacks (illustrated above) for Graniteville Company, S.C., a routine assignment.

A wire or letter will bring a qualified representative to discuss your problems with you.

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A sleeve, raised and lowered within a non-magnetic tube, attracts or releases an Alnico magnet attached to a mercury switch. Basically, this is Magnetrol.

MAGNETROL

The Simplest, Most Versatile LIQUID LEVEL CONTROL Ever Devised!

Linked to liquid level by infallible magnetic force, Magnetrol is free from the limitations inherent in mechanical or electrical controls. With the actuating magnet rated at 98% of initial strength after 30 years, Magnetrol has *infinite operating life*, with practically no maintenance at all. There are no wearing parts to get out of order.

What's more, Magnetrol's simple operating principle permits easy, economical modification of standard units to meet *any* pressure, temperature or corrosion requirements. That's why there's practically no limit to Magnetrol's use. It's also why "specials" are likely to be standard with us. Magnetrol units control level changes from .0025-in. to 150-ft. —with single or multi-stage switching.

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Please send me catalog data and full information on Magnetrol Liquid Level Controls.
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Company _____
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City _____ Zone _____ State _____

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New Plants (Cont'd)

million dollar magnesium plant in **Selma, Ala.**

Columbia, Tenn. planning $1,250,000 sewage disposal plant . . . **Yale & Towne Mfg. Co.** erecting $135,000 plant addition in **Gallatin, Tenn.** . . . Factory building costing $189,178 being planned by **Boss Mfg. Co.** for **Oneida, Tenn.**

West South Central

Southwest Concrete Materials Corp. to erect $500,000 aggregate plant in **Poyen, Ark.**

Bossier City, La. $1,000,000 water treatment plant . . . $600,000 office building for **La. Power & Light Co.** in **West Monroe, La.**

$1,000,000 pilot plant for **Western Electric, Inc.** being planned in **Oklahoma City, Okla.** and a 1,200,000 sq ft electronics mfg. plant scheduled in 1958.

Sunray Mid-Continent Oil Co. planning $3,000,000 processing plant in **Aransas Pass, Tex.** . . . $2,000,000 processing plant for **Warren Petroleum Corp.** planned for **Chambers County, Tex.** . . . 1959 completion scheduled for $16,400,000 expansion program of **Reynolds Metals Co.** in **Corpus Christi, Tex.** . . . Fall occupancy anticipated for $4,000,000 **Texas Instruments, Inc.** plant in **Dallas, Tex.** . . . $250,000 expansion for **Falstaff Brewing Corp.** of **El Paso, Tex.** . . . $15,000,000 expansion for **Texas Gulf Sulphur Co.** in **Galveston, Tex.** . . . **American Can Co** to expand in **Houston, Tex.** to sum of $2,000,000 . . . **Baker Oil Tools, Inc.** constructing $2,750,000 mfg. plant and $250,000 warehouse on 75 acre tract in **Houston, Tex.**... Underway is $1,000,000 factory for **Continental Can Co.** in **Houston, Tex.**... $600,000 steel fabricating plant underway for **De Laney Co.** on 80 acre tract in **Houston, Tex.** . . . **Lucky Lager Brewing Co.** erecting $3,000,000 brewery in **Houston, Tex.** . . . $30,000,000 low-pressure polyethylene plant underway for **Phillips Chemical Co.** in **Houston, Tex.** . . . **Texas Asphalt & Refining Co.** planning $1,000,000 plant on **Houston Ship Channel, Tex.** . . . Nearing completion is $26,000,000 plant for **Texas Butadiene & Chemical Corp.** at **Houston, Tex.** . . . **Thiokol Chemical Corp.** to spend $5,000,000 on expansion in **Marshall, Tex.** . . . January, 1958 completion anticipated for $2,000,000 chemical recovery smelter and precipitator for **Champion Paper & Fibre Co.** in **Pasadena, Tex.** . . . **El Paso Natural Gas Co.** planning $105,000,000 expansion in **Sonora, Tex.** . . . $1,000,000 plant for **Visco Products Co., Inc.** to be completed in January, 1958 in **Sugar Land, Tex.** . . . $4,000,000 low-end catalytic reformer and desulfurization facilities underway in **Sweeny, Tex.** for **Phillips Petroleum Corp.** with January, 1958 completion scheduled . . . **American Petrofina, Inc.** planning $1,500,000 expansion in **Wichita Falls, Tex.** . . . $1,500,000 modernization in **Wichita Falls, Tex.** for **Continental Oil Co.**

Kansas & Missouri

$200,000 plant being erected for **Smith & Loveless, Inc.** in **Lenexa, Kan.**

Schlitz Brewing Co. planning $180,000 addition to its brewery in **Kansas City, Mo.** . . . $350,000 of sewage improvements for **Marshall, Mo.** . . . $3,377,520 pumping station for **St. Louis, Mo.**

These highlights briefed from SPI's INDUSTRIAL NEWS SERVICE, a monthly publication issued exclusively to SPI advertisers and their representatives in the South and Southwest.

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USE SPI
READER SERVICE

See Pages 81-82

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By having your Safety-Relief-Gate-Globe-Check Valves rebuilt or serviced by us. Staffed with factory trained personnel we are able to give a new valve guarantee, cut down on time and freight charges. Work performed either in your plant or ours. Complete insurance carried. For particulars write:

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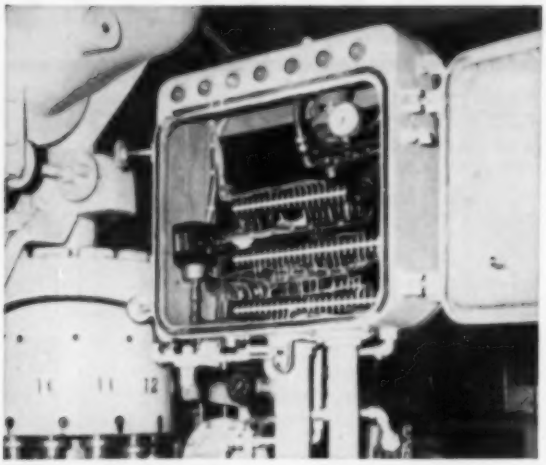

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Anaconda's new Densheath* 900 all-purpose wire—made with a new, high heat-resistant PVC insulation—gives plants an extra margin of protection wherever wiring is exposed to chemicals, oil or moisture *at high ambient temperatures;* and affords greater current-carrying capacity! Densheath 900 is approved as Type TW and can be used in National Electrical Code applications. In other applications, it can be used to its maximum rating of 90°C copper temperature. Available in sizes 14 Awg to 2000 Mcm. Write for descriptive Bulletin DM-5612. Anaconda Wire & Cable Company, 25 Broadway, New York 4, N. Y. 07348

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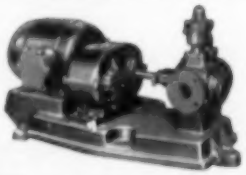

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Here's how you can restore "new pump" efficiency at a fraction of the cost of a new pump, thanks to Blackmer engineering and design.

REPLACEABLE LINER It takes only a matter of minutes to replace the liner of a Blackmer Pump after excessive wear has been caused by the handling of corrosive or abrasive materials.

REPLACEABLE VANES The vanes in Blackmer Rotary Pumps are self-adjusting for wear and give sustained efficiency over years of service. In case of extreme wear or damage, they can be replaced quickly, using only simple hand tools.

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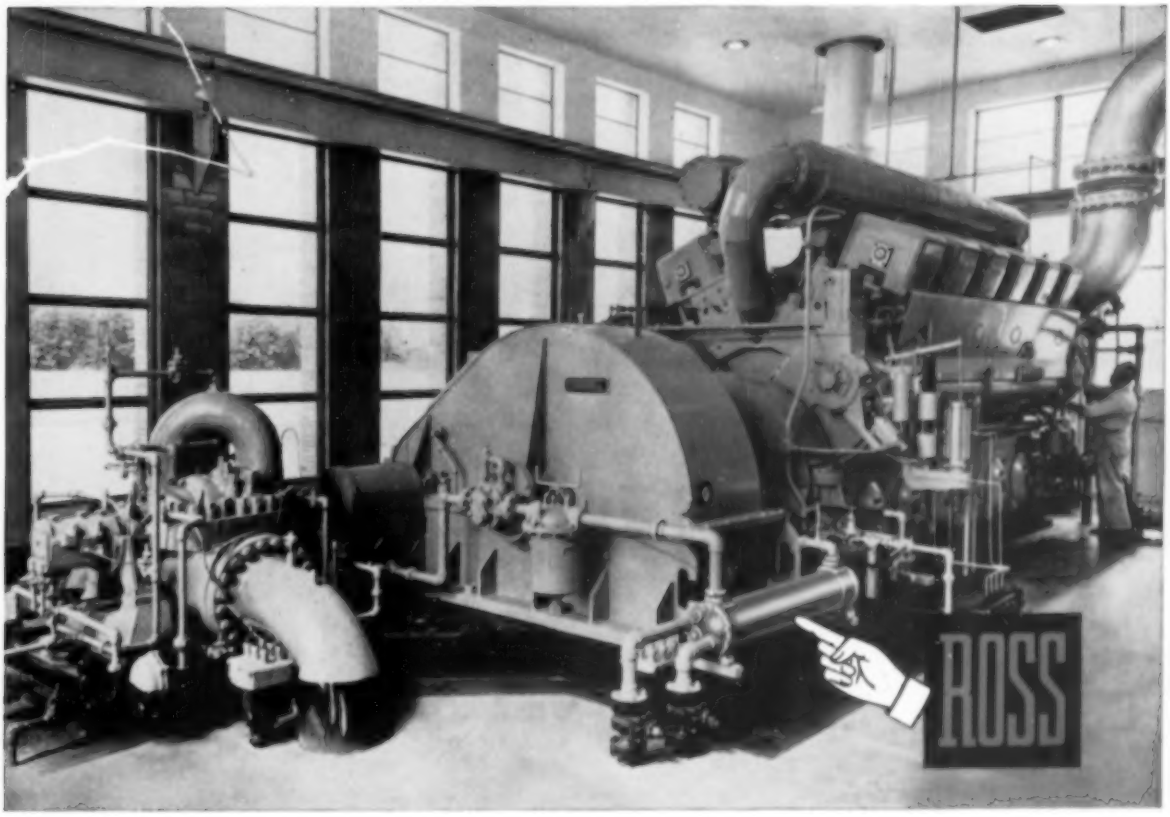

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